

Food Products Committee.

Protection of kabaragoya.

Representation of Food Production Committees or District Agricultural Committees on the Board of Agriculture.

Freight charges on manures on the Railway.

Further results of manurial trials with paddy.

Results of trials with *Coix lachryma*.

Results of variety trials with food crops at the Experiment Station, Peradeniya.

Results of experiments with kurakkan (ragi) at the Experiment Station, Jaffna.

Results of experiments with the use of tank silt at Experiment Station, Jaffna.

Facilities for travelling between Paranthan and Jaffna by the Railway.

Opening of a siding at Kilinochchi for goods and passenger traffic and the opening of a Receiving Office there.

Reduction of rail freight on manures for paddy cultivation.

Food value of kurakkan.

Paddy manurial experiments in Jaffna.

Free analyses of soils.

Establishment of markets and experiment stations.

Weed known as kudumetta in paddy fields.

Improvement of local cattle.

Possibilities of increasing food stuffs.

Paddy cultivation under the Karachehi Scheme.

Prevention of alienation of paddy land.

Agricultural education.

YEARBOOK.

45. The Yearbook issued in March, 1923, met with an appreciative reception by the agricultural community, and a further number containing details of the main lines of technical work accomplished by the Department during the year 1923 was prepared at the end of the year, ready for issue in March, 1924. The contents of this Yearbook are as follows:—

Introduction.

Soil erosion.

The control of tea termites.

Growth and yield in Hevea.

A Brown bast census.

Further observations on the nutfall of coconuts.

Abnormalities in coconuts.

Trials with different methods of planting paddy.

Cotton experiments.

Roselle.

The cultivation and extraction of sisal.

Fodder grasses on the Experiment Station, Peradeniya.

Further trials with fodder cholum.

Further experience with green manures and cover plants at the Experiment Station, Peradeniya.

Soft rot of *Vanilla planifolia* Andrews.

Plantain root beetle borer.

An emergency method of applying spray fluids.

Preliminary note on the agricultural economy of rats.

Improvement of chillies by selection.

Irrigation farming in Jaffna.

The Indian glow worm (*Lamprophorus tenebrosus* Wlk.).

46. The Annexures I. to X., attached to this report, give in detail the work of the different divisions of the Department, and it is only therefore necessary to review the principal activities of the Department in brief.

AGRICULTURAL INVESTIGATIONS.

47. Experimental work is carried out at the various experiment stations. These are now as follows:—

Major.—Peradeniya, Anuradhapura, Jaffna, and the Coconut Trial Ground at Chilaw.

Minor.—Experimental and Demonstration Plots at Weligama, Elpitiya, Bandaragama, Balangoda, Godakawela, Bibile, Dandagamuwa, Nalanda, Trincomalee.

Cotton Experiment Stations at Ambalantota, Taldena, and Embilipitiya.

Paddy Experiment Stations at Illapallachena and at Nindoor in the Batticaloa District.

Bunchy Top Disease of Plantains Experiment at Rambukkana.

48. At Peradeniya the main experimental work carried out is with tea, rubber, coffee, and cacao, while special attention is being given to the trials of green manures and fodder grasses and to the establishment of an economic area for seed supplies of high quality. At Anuradhapura special attention is given to sisal and limes, while here the main work of the Economic Botanist in the selection of pure lines of paddies is being done. The results of the extraction of sisal have been satisfactory, and it is expected that figures will shortly be available regarding yields and costs of production under Ceylon conditions. Some very good high yielding types of paddy have been isolated and a beginning has been made in testing these in various districts of the Colony. This work is of the utmost importance to the paddy growing area and will expand as the results of multiplication trials and the trials of growers become available. The problem in Ceylon is not an easy one owing to the differences in soils and climatic conditions in the different paddy growing areas, but sound progress is being made and a wider extension of the work has been begun. At Jaffna, valuable work has been done with tobacco and with the selection and variety trials with chillies and kurakkan. The crops of tomatoes on the experiment station have been large and profitable and indicate that a very valuable industry in tomatoes could be established on the Jaffna Peninsula. The experiments with fodder cholams have also been continued and high yields secured.

Several landowners have made trials on their own lands with peria manjal cholam and have been very satisfied with the results. The demand for seed is increasing and arrangements are being made for seed farm agreements to be entered into during the forthcoming year. The coconut experiments at Chilaw have been continued, and there has been a modification during the year of the programme of these experiments at the request of the Estates Products Committee. The yielding capacity of the palms in the different plots varies, and the results are difficult to analyse in the absence of adequate duplication. The value of lime on the heavy soil of the Chilaw District is being maintained and good results have followed the application of phosphatic manures. The value of cultivation has also been demonstrated and a considerable increase in ploughing and harrowing of coconut estates has followed the establishment of the experiments on this trial ground. The Elpitiya station has made good headway, and at it excellent growth of pineapples has been secured. At Nalanda, trials with cotton and tobacco have given valuable data, and the paddy experiments at this station are being followed closely by cultivators. The value of green manuring in paddy cultivation has been demonstrated at this station, and increased growth and crops have followed the trial of a crop of sunn hemp. At Godakawela, the possibilities of citronella, pineapples, and cinnamon have been demonstrated and good crops of food products raised. The Bible station is justifying its establishment and satisfactory crops of sugar cane, cotton, and tobacco have been raised, in addition to good crops of varieties of manioc and sweet potatoes. Sugar cane, particularly the thin hard types of canes, grows excellently on this station, and it is intended to establish a small mill for the production of raw sugar. If this is successful, there would appear to be a prospect of the introduction of sugar cane cultivation in the villages of the district. The Trincomalee station has required a considerable amount of capital expenditure to provide for better drainage, but good results have been obtained with the manurial experiments with paddy. Satisfactory results have been obtained from the cotton experiments at Ambalantota, and these experiments have given rise to the cultivation of cotton by small growers on an acreage exceeding 400 acres. Some 1,200 acres were taken on permit by small growers for cotton cultivation, but the abnormally wet season prevented the cutting down and burning off of the jungle. Weeds were also a great nuisance, and good work was done by Agricultural Instructors in educating cultivators as to the essentials of cotton cultivation and the necessity of prompt attention to weeds. There is no doubt that during the next year a considerably increased acreage will be brought under cotton cultivation in this district. Very high yields of cotton were also secured at the Taldena station, and between 20–30 acres are being grown by private owners as the results of these trials. It was decided to make further trials with cotton at Embilipitiya, and the growth in the early stages has been satisfactory. There is also a demand for cotton trials to be made in Walapane. The paddy experiment stations in the Batticaloa District have demonstrated the value of seed selection and of weeding. There is little doubt that the yields of paddy in this district could be very materially increased if more intensive forms of cultivation were adopted. The plantain plot at Rambukkana was established on land placed at the disposal of the Department by Gate Mudaliyar Samarakkody, with a view to ascertaining if a satisfactory treatment could be evolved for the bunchy top disease. This disease is present in all the plots and no variety so far tested appears to be immune to it. This disease is undoubtedly a most serious one and has so far defied elucidation. Much work has been done on it, both in Ceylon and in other countries, but a solution of the problem has not yet been forthcoming.

49. The disease of acacias caused by *Cercospora Theæ* has been prevalent during the year in some districts up-country, and has been responsible for the death of a number of plants. From the acacias it spread to tea, and is a disease that requires to be watched in areas which receive a heavy monsoon. The new disease—Witches' Broom—of tea was investigated during the early part of the year. This has been found to occur in various localities, but the cause of this disease has not so far been ascertained. Many losses of dadaps have occurred during the year and have been the subject of special investigations. On several estates the replacing of dadaps with other green manure plants is being taken up seriously and the demand for cuttings of *Gliricidia maculata* continues to be maintained. The nutfall of coconuts has been the subject of further investigation as well as the fall of immature nuts. It appears that certain palms are unable to carry their nuts to maturity, and this has been shown to be an inherent character and is not in all cases the result of fungus disease or of adverse environmental conditions. The tea shot-hole borer experiments have been continued. Those at Sarnia estate were completed during the year and show conclusively that this pest of tea can be controlled by manuring. With the increased attention to cultivation and to manuring the seriousness of this pest is diminishing, but its range of attack is gradually spreading. The diminution of this pest after good cultivation and high manuring emphasizes the importance to the tea industry of maintaining a high standard and of reducing as far as possible loss of soil from erosion. The use of green manures is strongly urged, and the various experiments which are now being made with creeping leguminous crops should be followed with the closest attention by all interested in the tea industry. The tea caterpillar (*Piesmopoda rufimarginella*) which was found in the Ramboda district last year has this year been found in the Kotmale and Badulla Districts. It is however highly parasitized and therefore is not likely under ordinary circumstances to become serious. An outbreak of *Coccus viridis* and *Saissetia hemispherica* occurred in the Haputale district and was the subject of investigation. The coconut caterpillar (*Nephantis serinopa*) continued to be serious in Batticaloa District in the early part of the year but the position improved somewhat later on. It has also been investigated in other localities by the staff of the Entomological division. It appears to be spreading and therefore demands close attention. The swarming caterpillar of paddy did considerable damage in the Eastern Province, both in the Batticaloa and the Trincomalee Districts. A serious outbreak also occurred at Tissamaharama. The plantain root weevil has received attention during the year and has been brought to the attention of plantain growers through illustrated leaflets in the vernaculars and through lectures. The Plant Pest Inspector, Central, has concentrated on shot-hole borer of tea, upon tea tortrix, and upon the plantain root weevil. Attempts to establish flight breaks of tea for tea tortrix have not been successful owing to the mixed nature of the jat of tea, and trials with other plants are now being made. The Plant Pest Inspector, Southern, has made investigations in regard to the incidence of Brown bast of rubber, and has carried out work in connection with outbreaks of coconut pests in the Southern Province and in regard to the control of water hyacinth in West Giruwa pattu.

50. The Agricultural Chemist has made investigations during the year in respect of the quality of tea. The soils of estates producing high qualities of tea have been analysed. Such soils are generally rich in nitrogen, and in every case show a markedly acid reaction due most probably to the presence of

soluble aluminium compounds. There is also invariably the presence of a considerable amount of the lower oxide of iron. Analyses of acacia barks from up-country have also been made, and a considerable amount of work done in connection with the adulteration of citronella oil and in regard to the rubbishy tea exports, which are now the subject of special investigation by a Committee appointed by Government.

51. The Economic Botanist has continued the work at Anuradhapura and Peradeniya in the production of selected pure line types of paddy. A start has also been made at Peradeniya in the improvement of the local vegetables.

SOIL EROSION.

52. The most serious problem that agriculturists have to face in Ceylon to-day is that of soil erosion, and one has only to look at some of the opened land up-country to realize the seriousness of the problem. An endeavour has been made during the year to bring this subject forcibly before the attention of agriculturists. Special articles have been published in the *Tropical Agriculturist* and lectures have been given before the Dimbula and Sabaragamuwa Planters' Associations. The subject has been discussed at length before the Estates Products Committee, and a Sub-Committee was appointed to go into the subject as it effects unalienated lands. The report of this Sub-Committee is as follows :—

REPORT OF SUB-COMMITTEE OF ESTATE PRODUCTS COMMITTEE OF THE BOARD OF AGRICULTURE TO CONSIDER SOIL EROSION.

THIS Sub-Committee was appointed at the meeting of the Estate Products Committee held on November 8, 1923, to consider what steps, if any, could be taken by Government to check soil erosion by making stipulations under which the alienation of Crown land would be granted in the future.

At a meeting held on January 10, 1924, at Peradeniya, various proposals were very closely examined, and it was decided to make the following recommendations :—

(1) That no Crown land with a slope of 60 degrees or over should be alienated, except on the following conditions :—

- (a) That such land if forest be retained in forest and be not opened for cultivation ;
- (b) That such land if patana be used solely for afforestation purposes.

(2) That 10 per cent. of all Crown lands, exclusive of stream reservations, alienated after the date of passing the necessary Ordinance or of bringing into force the necessary regulations for planting in tea or rubber shall be kept in forest or shall be planted in forest.

(3) That provision should be made for the proper planting up of all stream reservations with suitable timber approved of by the Forest Department, and for the utilization of such plantings on lines recommended by the Forest Department.

(4) That in cases where it is to the interest of the State, as determined by the Forest Department, that privately owned lands, steep in slope or in catchment areas of important rivers or streams, should be under forest, the Government should be prepared to issue free to the owners of such lands the necessary seeds or plants for planting them up and/or to make monetary grants to such owners for their planting in forest.

(5) That further experiments should be carried out by the Agricultural Department to determine in Ceylon the amount of soil erosion which is annually taking place in the principal planting districts.

F. A. STOCKDALE (Chairman).

J. GRAEME SINCLAIR (Chairman, Planters' Association).

A. E. RAJAPAKSE.

M. L. WILKINS.

D. S. CAMERON.*

M. KELWAY BAMBER.

C. E. A. DIAS.

JOHN HORSFALL.

* I dissent from the recommendation No. (4)

This effort to introduce the agriculturists of Ceylon in the necessity of conserving their soil has given rise to a demand for green manures, and various trials have been begun. It is hoped that these endeavours will be continued and that in a few years a much greater use of green manures will be the rule in Ceylon cultivations of tea, rubber, and coconuts.

COMPETITIONS.

53. The number of prize-holding competitions has again increased and the number of entries almost doubled during the year. These competitions are mainly held amongst paddy growers and the growers of vegetables. They are considered by the various District Agricultural or Food Production Committees, which decide upon the general lines on which they should be seen and upon the various points which it is desired to emphasize. These Committees discuss the arrangements of these competitions with the agricultural officers, under whose supervision these competitions are organized. The preliminary judging is done by agricultural officers and the final judging by agricultural officers in co-operation with unofficial members of the various Committees. The work of competitors showed considerable improvement during the year, and since fairly substantial prizes have been offered increased competition amongst entrants has been noticed. Arrangements have been made for competitions to be held amongst small growers of cacao in the Kandy District and of tea in the Kotmale district. The arrangements regarding competitions are now being more fully advertised some time before entries are accepted, and there is no doubt that such work is having a good effect towards inducing small growers to adopt more intensive methods of cultivation.

The following prize has been contributed by the Hon. Lieutenant-Colonel T. Y. Wright for competition among school gardens in the North-Western Province during the year:—Rs. 100 ; and the thanks of the Department are due to him.

AGRICULTURAL SHOWS.

54. Agricultural shows are held during the year at the following centres :—Dambulla, Trincomalee, Nuwara Eliya, Kandy, Jaffna, Batticaloa, Weudawili hatpattu, and Dewameddi hatpattu.

In the organization of all these shows, agricultural officers played an important part and acted as judges of a large number of classes. The Agricultural and Industrial Show at Jaffna in June, 1923, was a great success and credit is due to the Secretary, Mudaliyar V. M. Muttukumaru, and to those associated with him in its organization. Another large show was held at Kandy during the Perahera week in August, and it is intended to make this show an annual event. At several of these shows, the Department of Agriculture had stands at which were exhibited samples of crops grown on experiment stations, and of various pests and diseases of economic crops. Trained officers were stationed at these shows with the exhibits and were able to give information to inquirers on agricultural matters. The exhibits of pests at Kandy attracted considerable attention and useful information was disseminated at this show. The leaflets of the Department were also distributed at these shows and attention drawn to the bulletins and other publications of the Department. Special leaflets on paddy cultivation and fruit cultivation were prepared for the Gampaha Show and special lectures and demonstrations arranged for. These were fairly well attended, and there is no doubt that the paddy cultivation demonstration organized by the Economic Botanist in connection with this show served a useful purpose. It enabled the Department to show how the work of pure line selection of paddy is carried out, and how the results of such selections are submitted to very careful field tests before they are distributed.

BRITISH EMPIRE EXHIBITION.

55. This Department was made responsible for the collection of exhibits for the Miscellaneous Agricultural Section of the Ceylon Court at the British Empire Exhibition. Representative samples of paddies, food grains, agricultural implements, together with extensive samples of cottons, kapok, roselle, palmyra, and kitul fibres, papain, wattle bark, and other products. The following description of these exhibits appears in the Exhibition Guide Book :—

The exhibits in the Miscellaneous Agricultural Section will consist of a comprehensive exhibit of paddy and other food grains of the Colony. Pulses, starches, and meals, spices, and condiments, oils and oil-seeds, drugs, tanning materials, and dyes are also being shown. Examples of the implements used in paddy cultivation in Ceylon are also being exhibited, models of some of the vegetables and fruits have been prepared and samples of cotton, sisal, roselle, and other fibres grown on the Experiment Stations of the Department of Agriculture are shown.

Samples of 45 of the chief paddy varieties are being shown, while smaller samples of 200 varieties of paddy grown in the Island are exhibited in wall cases. The dry grains consist of kurakkan, Indian corn, amu, meneri, tanai, samai, sorghums, beans, green and black gram, kollu, and gingelly. These dry grains are largely cultivated, and, with paddy, form the staple food products of the Island. Starches and meals include cassava meal, maize meal, kitul flour, jak flour, plantain flour, madu flour, arrowroot, and dried palmyra roots. Madu flour, if found worthy of commercial exploitation, could be produced in large quantities.

In the drug section, special attention is drawn to the exhibits of White Burley type of tobacco. The experiments which have been carried out in recent years show that crops of this type of tobacco of good quality can be produced, and efforts are now being made to establish an export trade.

Fibres are exhibited to the right of the section. Recent experiments have shown that cotton of fair length and quality can be grown successfully in certain parts of the Colony. There are possibilities that an industry of considerable importance can be built up and the yields of cultivations so far carried out have been promising. With the opening of the new Batticaloa-Trincomalee Light Railway, considerable areas of good land suitable for cotton cultivation will be provided with satisfactory transport facilities. Sisal is being grown up on one estate in the Dry Zone and machinery is now being erected. Examples of sisal fibre grown at the Anuradhapura Experiment Station are being exhibited and attention is also drawn to the exhibit of roselle fibre. Kapok has received considerable attention commercially in recent years, and the sample which is being shown will illustrate the possibilities before Ceylon in regard to this floss. Other fibres being shown include bow-string hemp, Mauritius hemp, sunn hemp, kitul, palmyra, and other common bast fibres of Ceylon. Attention is drawn to the collection of spices and condiments consisting of nutmeg, mace, vanilla, cloves, ginger, turmeric, sarsaparilla, tamarind, garlic, chillies, and goraka.

The roots of khus-khus grass are also exhibited and small bundles of these will be available for distribution. They are used in the tropics amongst linen and in book cases. Heavy oils, together with the seeds from which they are obtained, comprise kekuna, margosa, domba, mé, croton, dudu, and gingelly, while tanning materials consist of wattle, kumbuk bark, and ranawara. A good sample of a sappan log is shown in the dyes section, as well as sappan chips, jak bark, chaya roots, and annatto seed.

Special attention is invited to the estate prepared samples of papain, and to the Ceylon produced camphor and citrate of lime.

The exhibits of the agricultural implements used in paddy cultivation, to be seen on the left of this section, should prove of interest to agricultural students and to manufacturers of agricultural implements. The two common types of Kandyan plough and the common Low-country plough are being shown together with levellers, sickles and other implements, while a complete set of models of all the implements used in the agriculture of the north has been secured.

Models of various fruits and vegetables have been prepared and examples of pumpkins grown in the Colony are also being exhibited.

56. The work of preparing the Ceylon Handbook for this Exhibition was entrusted to the Director of Agriculture and a Sub-Committee consisting of the following gentlemen :—The Hon. Mr. F. A. Stockdale, Director of Agriculture (Chairman); Mr. L. J. B. Turner, Director of Statistics; Mr. C. A. Galpin; Mr. C. Drieberg; Mr. H. J. Crosskey.

DISTRICT AGRICULTURAL COMMITTEES.

57. During the year the sphere of work of several of the old Food Production Committees has been extended and such Committees have been constituted as District Agricultural Committees. The operations of such Committees now cover the following :—

- Organization of agricultural industries of small owners.
- Organization of societies for co-operative sale of produce.
- Food Production, investigation into irrigation facilities, supplies of seed, manure, &c.
- Organization of agricultural shows and competitions.
- Agricultural experiments and investigations.
- Co-operative credit and organization of cultivators' societies.

When the amending Plant Pests and Diseases Ordinance is passed by the Legislature, the control of the spread of plant pests and diseases.

Such committees have been formed for the Kandy, Nuwara Eliya, Matale, and Kegalla Districts and details of some of their work is given in the report of the Divisional Agricultural Officer, Central. The formation of a similar committee for the Matara District was under discussion at the end of the year. The Food Production Committees of Ratnapura and Hambantota have been active during the year and useful work has been done. Other committees which held meetings during the year have been Anuradhapura and Matara.

AGRICULTURAL EDUCATION.

58. The number of students at the School of Tropical Agriculture, Peradeniya, at the end of the year was as follows:—First-year 14, second-year 15. The Prize Day of the school was held on August 25, at which the Hon. the Colonial Secretary presided and Mrs. Clementi distributed the prizes. The report at this prize distribution was as follows:—

This is the sixth prize-giving of the School of Tropical Agriculture and the third since the buildings here were opened in 1921.

The last final examinations for the English and Vernacular Teachers' Classes were held in March this year, and it is to the students and teachers of these classes that awards and certificates are being distributed to-day. Fourteen English-speaking students took up their examination and all passed. Of these, 2 were placed in the first class and 3 in the second class. The results showed an improvement on the previous year. Of the 12 Government teachers, 11 passed satisfactorily, while 1, whose attendance and general efficiency were marred by continual illness, was required to spend a further term before being granted a certificate.

The new school year commenced in May, when 16 students for the course in English and 12 teachers for the vernacular course were admitted. The total number on the roll at present is 44. A class of students from the Training Colony, Peradeniya, also continues to attend a course of instruction in agriculture. The school and hostel are under the general supervision of the Divisional Agricultural Officer, Central, as Vice-Principal, while Mr. J. C. Driberg continues to be in immediate charge as Farm School Officer. Consequent to the vacancy which occurred in the division of the Economic Botanist, Mr. G. V. Wickremasekera, who paid special attention to the subject, Plant Improvement, during his course of study in India, was transferred from the school last month, Mr. R. S. D. Jansz, who passed through the school in 1921 and since then was on the tutorial staff of St. John's College, Panadure, being selected to fill the vacancy. Mr. C. Wickremaratne continues the work with the vernacular class. Mr. E. S. de S. Jayasundera, who was serving in the capacity of a volunteer at the time of the last prize-giving was subsequently appointed as Farm and Laboratory Assistant. The work in estate accounts continues to be taken by Mr. C. Perera, the Accountant of Pallekelly estate. Regular demonstrations in planting and in horticulture are given by the Manager, Experiment Station, Peradeniya, and the Superintendent, Botanic Gardens, respectively. Lectures in co-operation are given by Muhandiram N. Wickremaratne, Secretary, Board of Control, Co-operative Credit Societies.

With the staff of this school must always be associated the name of the late Mr. H. L. Van Buuren. He was one of the four scholars sent to India for agricultural training, who on their return, were attached to the school when it was opened in 1916. He worked in the best interests of this institution for four years, and later was doing efficient work in the sphere of Economic Botany. I desire to express my appreciation of the assiduity with which he performed his duties, and of the high quality of his work. It is to be regretted that a career of much promise has ended so early. The return of Mr. G. E. J. Hulugalle, who was also previously on the staff of the school, from a special course of higher training in Agriculture at Cambridge University has to be recorded.

The general work of the school continues to be satisfactory, but much is still to be desired on the practical side. A subject such as agriculture demands a high and continuous degree of efficiency in fieldwork, which must be pursued at all times and regardless of the condition of the weather. The importance of this aspect of the work at the school cannot be too strongly urged, and it is to be confidently hoped that students who come here for a training will realize that they can only obtain the full advantage of the courses by application in the field. The prize that has been offered by His Excellency the Governor, as an encouragement to efficiency in Practical Agriculture, goes to the student who not only shows aptitude in field study but also does good work on his plots.

The activities of the school are gradually becoming varied and are widening. Bees and poultry have been introduced, while provision has been made for the establishment of a small dairy during the forthcoming financial year.

The annual tour of the school took place in March 1, when the first and second-year students went to Jaffna and Anuradhapura. Visits were paid to the Government Experiment Stations, to estates, and farms, to the Ratmale Colony, where the students were kindly met by Mr. H. R. Freeman, and to Sravasti estate. On the tour, the students were entertained by Mr. W. A. de Silva at Anuradhapura and Mr. Sunderam at Pallai. The teachers' class visited five schools around Peradeniya, at Rambukkana, and Mirigama, at all of which good school gardens are to be seen. The outdoor work of the children was scrutinized, and this was followed with lessons on agricultural subjects in the classroom. At the end of the day, the teachers in training and the staff of the visited school met for discussion of matters relative to their work, and this proved to be of mutual advantage. The teachers expressed their appreciation of the scheme of work and of the arrangements made.

Up to now 147 students have passed through the school, and gained certificates; of whom, 36 have joined the Department of Agriculture. Fifty-five passed students are engaged in work on estates; while 20 have transferred their interests to spheres other than agriculture. It is satisfactory to note that the work of 70 per cent. of the past students of this school is connected with agriculture. The work of the school has been in progress now for over seven years, and it would appear to be opportune to make a few remarks on agricultural education in general.

In the elementary schools special attention is given to the school garden work and to the teaching of nature knowledge. Attention is also given to the encouragement of pupils in home gardens. Special courses for teachers in these vernacular schools at the Peradeniya School of Agriculture have given an agricultural bias to their training and there is now a desire for an agricultural reader for these schools. This has been drawn up by Mr. C. Driberg, who was formerly Vice-Principal of the School of Tropical Agriculture at Peradeniya, and is being translated into the vernaculars. The School of Tropical Agriculture at Peradeniya provides courses which are of a practical character, with a view to fitting students to tackle local agricultural problems, to cultivate more successfully their own lands, and to become efficient assistants on estates, Agricultural Instructors, or Inspectors. Emphasis is laid on the practical side of this training and encouragement is given to students to make research investigations of an elementary character while at the school. The buildings for a similar school in the north will be completed during the forthcoming year. At these schools it is intended to provide an essentially practical course of training in agriculture, and specially designed to meet the requirements of those making agriculture their life's work. The higher training in the sciences of agriculture will be provided by the University College in conjunction with the Research Branch of the Department of Agriculture.

The donors of the awards, which are an earnest of their interest in the work of the school, we tender our most cordial thanks. His Excellency the Governor gives a prize for general efficiency in Practical Agriculture and Gate Mudaliyar A. E. Rajapakse again offers the Gold Medal for the best all round student of the course. The other gentlemen who have kindly given prizes are Sir Solomon Dias Bandaranaike, Sir H. Marcus Fernando, the Hon. Mr. H. L. de Mel, Mudaliyar V. M. Muttukumaru, Mr. J. C. Ratwatte, Dissawa, Mr. E. A. Elapata, Dissawa, Mr W. A. de Silva, Mr. Graham Pandithasekera, and Muhandiram N. Wickremaratne.

We have great pleasure in welcoming you, Sir, this afternoon, as we are conscious of the keen interest you take in matters pertaining both to agriculture and to education. I also have to express our appreciation of your presence, Mrs. Clementi, and to thank you for having so graciously consented to distribute the awards and certificates to-day.

The special course of training for vernacular teachers was also provided for at the School of Tropical Agriculture, Peradeniya, during the year, and 12 selected teachers from Government vernacular schools.

59. Work in connection with the buildings for the Agricultural School at Jaffna has continued during the year, and it is expected that these buildings will be completed during 1924.

60. The work in the school gardens attached to vernacular elementary schools has been satisfactory during the year, but nature teaching in the schools still leaves much to be desired.

61. School garden work has improved in many areas and it is gratifying to note the high standard of improvement attained by the schools in the Colombo District during the period under review: the Senior Agricultural Instructor in charge has succeeded in his attempt to bring the work of the Ratnapura District to a level with that of the Colombo District, which has now reached a high standard. School garden work in the Kurunegala District of the North-Western Province continues to improve year by year, thanks to the offer of the prize by Hon. Lieutenant-Colonel T. Y. Wright for competition among school gardens in the North-Western Province, which attracts a fair number of competitors.

The establishment and care of home gardens is receiving its due share of attention by pupils attending those schools which own registered school gardens, and it is evident that teachers and pupils alike are beginning to realize the value of extension work. There are still some districts where home gardens have not developed to any extent, and there has been a falling off in this direction in the Central Division. Endeavours are being made to instil in teachers and pupils the importance of agricultural education, on the lines adopted by the Department.

The money prizes shown in the list attached are for distribution among teachers, assistant teachers, and pupils equally, while awards for creditable home gardens are personal to the recipients.

During the year a further supply of implements has been made to the more deserving school gardens in all districts, and the equipment of such gardens can be said to be satisfactory.

Supplies of seeds and plants also continue to be made by the Central Seed Store and the Royal Botanic Gardens, Peradeniya.

It may be recorded that the standard of work in school gardens continues to progress, and it is hoped that the officers concerned will be able to show material improvement in agricultural education.

The number of registered school gardens is as follows:—

Central Division	..	143	Colombo District	..	47
Southern Division	..	138	Ratnapura District	..	43
Northern Division	..	54	Badulla District	..	26
North-Western Division	..	86	Batticaloa District	..	22

62. Awards and prizes for school gardens to the value of Rs. 2,915 were distributed during the year as follows:—

	Special.	First.	Second.	Third.	Certificates.
Kandy District	.. —	6 ..	5 ..	8 ..	10
Matale District	.. —	— ..	— ..	3 ..	4
Nuwara Eliya District	.. —	— ..	3 ..	2 ..	3
Kegalla District	.. —	3 ..	6 ..	6 ..	8
Kalutara District	.. 1 ..	1 ..	4 ..	12 ..	5
Galle District	.. —	2 ..	2 ..	8 ..	4
Matara District	.. —	3 ..	7 ..	6 ..	4
Hambantota District	.. —	— ..	1 ..	9 ..	3
Anuradhapura District	.. —	8 ..	5 ..	6 ..	—
Jaffna District	.. —	— ..	— ..	1 ..	—
Mullaattivu District	.. —	1 ..	1 ..	1 ..	—
Mannar District	.. —	— ..	2 ..	— ..	—
Colombo District	.. 1 ..	2 ..	4 ..	11 ..	5
Kurunegala District	.. —	7 ..	1 ..	18 ..	—
Chilaw-Puttalam District	.. 2 ..	1 ..	1 ..	5 ..	—
Ratnapura District	.. —	1 ..	7 ..	14 ..	6
Province of Uva	.. —	1 ..	2 ..	8 ..	4
Batticaloa District	.. 1 ..	2 ..	3 ..	2 ..	—

63. The awards of prizes for home gardens to the value of Rs. 575 were made during the year as follows:—

	First.	Second.		First.	Second.
Kalutara District	.. 4 ..	12	Kurunegala District	.. 11 ..	12
Galle District	.. 3 ..	10	Chilaw-Puttalam District	.. 5 ..	6
Matara District	.. 4 ..	11	Ratnapura District	.. 26 ..	33
Hambantota District	.. 2 ..	12	Batticaloa District	.. 7 ..	1
Colombo District	.. 13 ..	23			

Certificates were also issued to all winners of prizes.

64. Expenditure on implements amounted to Rs. 4,839.70 for the financial year 1922-23, and seeds and plants to the value of Rs. 4,994.63 were also sent to the school gardens, Government quarters, and villages.

There are a number of school gardens which are awaiting registration owing to want of funds for initial equipment. This initial equipment has in the past been provided by the District School Committees, but it is now found that sufficient funds are not available. A complete list of the school gardens awaiting registration has been made and it has been recommended to Government that a special vote

should be taken for their initial equipment. There is no doubt that the work of school gardens should not be handicapped for want of funds, as it is most important that the youth of the country should be taught nature knowledge, school gardening, and elementary agriculture in the schools of all districts.

EXTENSION WORK.

65. The object of the work was fully set out in last year's report and it was stated that good solid progress was being made with this work of the Department. The reports of the Divisional Agricultural Officers and of Agricultural Instructors given in the Annexure show the work that has been accomplished during the year. There is no doubt that the work is assisting towards the development of village agriculture, and the number of requests for information and for assistance and advice continues to increase.

CO-OPERATION.

66. Annexure VIII. gives details of the work of Co-operative Societies to the end of the year. Steady progress in many districts continues to be made, but the Kandyan Provinces leave much to be desired. Assistance has been rendered to societies during the year by Agricultural Instructors, and in many such cases solid progress has been made. Several societies which were slack have been improved and keener office bearers selected. In the Southern Province, progress is being made and it is expected that the time is not far distant before a central society will be needed to assist in the financing of the primary societies of the area. In the Eastern Province, the Paddy Bank has made loans amounting to Rs. 53,803 to affiliated societies. The members of societies in north Batticaloa have experienced two successive bad harvests, and are in arrears in the repayment of loans. In south Batticaloa repayment has been better, but it could have been still better. Every endeavour is being made to impress upon members the importance of prompt repayment of loans. If this is not done, and if Committees allow such unpunctuality to occur, rapid progress is not possible. This handicap to development of co-operation in Ceylon cannot be too strongly emphasized, and should receive the special attention of all—officials and unofficials—interested in the co-operative movement.

BOTANIC GARDENS.

67. Full details of the work of the Botanic Gardens are given in Annexure IX. At Peradeniya the improvement of the arboretum has continued and special attention has been given to the improvement of an area near the end of the Royal Palm Avenue. The coconut summer house has been completely rebuilt and improved. The pinetum has also received attention during the year, the whole of the fernery and glass house overhauled and improved, and new sheds for pot plants erected. The nurseries have also been improved and are now well stocked with young stock. At Hakgala, the work of improving the rockery has been continued and several new rock plants added. A new bulb garden has been begun and an area of the fernery overhauled and devoted to Ceylon ferns. The trial of various timber trees on patana lands is being continued and is likely to produce results of value. At Henaratgoda, improvements have been effected and certain minor changes made.

68. During the year plant lists of the Hakgala and Henaratgoda Botanic Gardens were prepared and published for official use. These lists are valuable for departmental use and for distribution to those botanical institutions, with which exchanges of seeds and plants are made. A similar list for the Royal Botanic Gardens, Peradeniya, is contemplated for 1924.

SEED DISTRIBUTION AND PUBLICATIONS.

69. Details of the work of this division are given in Annexure X. The demand for seed continues to increase, and specially for seed of green manures.

70. The following publications were issued during the year :—

The "Tropical Agriculturist," Vols. LX. and LXI.

The "Govikam Sangarawa," Vol. XVII., Parts 7-12, and Vol. XVIII., Parts 1-6.

The "Kamat Tholil Velakkam," Vol. XVII.

Bulletins of the Department of Agriculture.

No. 61.—Forest Soils of Ceylon.

No. 62.—The West African Oil Palm and its Products.

No. 63.—Bee-keeping for Beginners.

No. 64.—The Toxicity of Lime to *Fomes lignosus* Klotzsch.

No. 65.—Experiments with the Green Muscardine Fungus on Rhinoceros Beetle Larvæ.

No. 66.—Experimental Errors of Field Trials with Hevea.

No. 67.—A Preliminary List of the Pests of Cultivated Plants in Ceylon.

No. 68.—Yield and Growth in *Hevea brasiliensis*.

Leaflets.

No. 23.—Cultivation of the Robusta Types of Coffee (Revised edition).

No. 24.—Notes on Termites attacking Tea.

No. 25.—Cholam-Sorghum.

No. 26.—White Burley Cultivation in the Jaffna District.

No. 27.—Fruit Cultivation.

No. 28.—Paddy Cultivation.

EXPENDITURE.

71. The following is a statement of expenditure for the financial year 1922-23 :—

	Rs.	c.		Rs.	c.
Salaries ..	222,701	8	Laboratory expenses for School of Tropical Agriculture ..	836	68
Travelling ..	58,947	86	Labor and upkeep, New Peradeniya lands ..	1,828	41
Gardens—Labour and Upkeep :—			Dieting of students ..	6,504	3
Peradeniya Gardens ..	23,635	86	Co-operative Credit Societies :—		
Hakgala Gardens ..	6,661	5	Salaries ..	6,079	71
Henaratgoda Gardens ..	2,973	95	Travelling ..	1,330	20
Nuwara Eliya Gardens ..	2,172	77	Incidental expenses ..	16	35
Queen's House Gardens ..	2,525	52	Seed Store and Publication Depôt :—		
King's Pavilion Gardens ..	2,777	33	Salaries ..	4,104	0
Queen's Cottage Gardens ..	4,456	63	Seed distribution ..	5,945	13
Temple Trees Gardens ..	1,052	76	Publications ..	9,281	13
The Lodge Gardens ..	424	40	Incidental expenses ..	195	33
Cuddesdon Gardens ..	886	6	Special Expenditure :—		
Nursery work in Colombo ..	255	35	Experimental cultivation of tobacco ..	1,156	78
Experiment Stations :—			Grants-in-aid for agricultural shows and competitions ..	5,428	9
Peradeniya ..	30,086	68	Training of Secretaries for Co-operative Credit Societies ..	663	70
Jaffna ..	11,745	85	Experiments and demonstrations with paddy manuring and seed selection ..	5,985	87
Anuradhapura ..	18,335	73	Upkeep of additional minor experimental and demonstration plots ..	9,688	13
Chilaw Coconut Trial Ground ..	2,049	58	Cotton experiments ..	9,344	1
School and Home Gardens—Labour and upkeep ..	9,307	71	Equipment of Mycological Laboratory ..	9,049	3
Upkeep of library, laboratories, &c. ..	4,613	19			
Prevention of plant pests and diseases ..	1,450	68			
Incidental expenses ..	2,503	46			
Agricultural Education :—					
Salaries ..	6,682	68			
Scholarships ..	1,428	66			
Travelling ..	245	85			
Lecturing fees ..	843	0			
Incidental expenses ..	957	33			
			Total ..	497,157	60

This expenditure may be itemized under the following sub-heads :—

	Rs.	c.
Administration ..	32,576	43
Research : Scientific investigations, including Central Experiment Station ..	144,252	12
Botanic Gardens, including gardens of Governor's and Colonial Secretary's residences ..	82,538	36
Agricultural Education, including School of Tropical Agriculture, School Gardens, grant to shows and competitions ..	40,847	22
Divisional Experiments, including special expenditure on tobacco cultivation, Experimental Cultivation of Cotton, and Experiment Stations in Jaffna, Anuradhapura, and other experimental plots ..	169,327	92
Co-operative Credit Societies ..	8,089	96
Seed Store and Publication Depôt ..	19,525	59
Total ..	497,157	60

RECEIPTS.

72. The following is a statement of receipts for the financial year 1922-23 :—

	Rs.	c.
1. Sale of seeds and publications ..	23,217	97
2. Botanic Gardens, Peradeniya ..	2,804	95
3. Botanic Gardens, Hakgala ..	831	31
4. Botanic Gardens, Henaratgoda ..	101	20
5. Botanic Gardens, Nuwara Eliya ..	4	0
6. Experiment Station, Peradeniya ..	25,171	14
7. Experiment Station, Anuradhapura ..	3,526	65
8. Experiment Station, Jaffna ..	2,278	61
9. Experiment Station, Trincomalee ..	148	39
10. Experiment Station, Balangoda ..	71	39
11. Experiment Station, Godakawela ..	77	54
12. School of Tropical Agriculture ..	8,593	51
13. Central Agricultural Division ..	102	30
14. Southern Agricultural Division ..	8,242	30
Total ..	75,171	26

PRESS COMMUNIQUÉS.

73. The following *communiqués* were sent to the Press during the year :—

1. Cotton at Ambalantota.
2. Pineapple Cultivation.
3. School Gardens—Prize Competitions.
4. Agricultural Education—Success in England.

LEGISLATION.

74. The following Ordinances affecting agriculture were passed by the Legislative Council during the year :—

- (1) Protection of Kabaragoya (Ordinance No. 12 of 1923).
- (2) Employment of Women, Young Persons, and Children in Factories (Ordinance No. 6 of 1923).

The amendment of the Plant Pest and Disease Legislation was also considered by the Legislative Council during the year, and was referred to a Select Committee for the reconsideration of certain points raised when the Bill was passing through Council. The work of this Committee will be completed early in 1924, and it is hoped that the revised Bill will come into operation before the middle of that year.

STAFF CHANGES.

75. It is with great regret that I record the death on June 14, 1923, of Mr. H. L. Van Buuren, Assistant to the Economic Botanist. Mr. Van Buuren was one of the first four Ceylonese students selected in 1912 for special agricultural training at Poona Agricultural College, India. He did well at this College, but upon his return to Ceylon he had somewhat indifferent health. In spite of ill-health he performed useful work at the School of Tropical Agriculture as a lecturer and later as Assistant to the Economic Botanist. Mr. Van Buuren was devoted to his work and had been selected for special promotion. If he had possessed robust health, he would have performed work of value to Ceylon, as he showed during his lifetime the true spirit of the investigator. His premature death has robbed the Department of a promising young officer.

76. The following staff changes took place during the year :—

- (1) Mr. F. P. Jepson, Assistant Entomologist, who was on leave in England, returned to the Island and resumed duties on July 16.
- (2) Dr. J. C. Hutson, Entomologist, left for England on leave on July 24.
- (3) Mr. T. H. Parsons, Curator, Peradeniya Gardens, left for England on leave on May 16.
- (4) Dr. G. Bryce, Assistant Botanist and Mycologist, resigned his post from July 31.
- (5) Mr. G. Harbord, Divisional Agricultural Officer, who was away on leave in England, returned to the Island and resumed duties on September 25.
- (6) Mr. W. P. A. Cooke, Assistant Farm School Officer, Jaffna, left for America for higher training on June 17.
- (7) Mr. G. E. J. Hulugalle, who left for Cambridge for higher training, returned to the Island and assumed duties as Divisional Agricultural Officer, North-Western Division, from October 1.
- (8) Mr. A. W. R. Joachim, B.Sc. (London), A.I.C., Diploma in Agriculture (Cantab.), was appointed to officiate in the post of Office Assistant to the Director of Agriculture with effect from October 1, *vice* Mr. R. Aluwihare transferred back to the Civil Service.
- (9) Mr. M. S. Mendis, Sub-Inspector, Plant Pests Inspectorate, left for Poona for higher training from May 26.

The following appointments, changes, and retirements took place during the year in the Clerical, Agricultural, Research, and Field Staffs of the Department :—

(a) *Appointments : Clerical.*—Mr. K. Subramanian was appointed Bookbinder from January 1.

Research Branch.—Messrs. R. S. D. Jansz and Jubert de Silva as Probationers from July 15.

Field Branch.—Mr. T. Vytialingam as Assistant Foreman from April 1; Mr. J. E. Lawson as Nurseryman, Hakgala, from September 1, *vice* Mr. Christoffels; Mr. W. P. de Alwis as Upper Gardener from February 1, *vice* Mr. T. de Silva deceased.

(b) *Changes : Clerical.*—Mr. J. N. Culanthaivalu as Chief Clerk from July 1, *vice* Mr. R. H. Pereira transferred; Mr. V. C. Arulanathan as Finance Clerk from July 15, *vice* Mr. J. N. Culanthaivalu; Mr. A. W. de Zoysa as Clerk to the Entomologist from May 10, *vice* Mr. M. B. Medagama transferred; Mr. K. B. Alahakoon as Clerk, Head Office, from March 1, *vice* Mr. L. Ratnasabapathy deceased; Mr. C. W. de Alwis as Clerk, Head Office, from October 1, *vice* Mr. L. B. Kapuwatte dismissed; Mr. D. P. Jayatilleke as Clerk to Divisional Agricultural Officer, Southern Division; Mr. H. M. Rasnayake as Clerk to the Economic Botanist; and Mr. M. D. H. Perera as Clerk to Manager, Experiment Station, Anuradhapura, from August 1.

Agricultural Branch.—Mr. T. V. Thamotheram to Experiment Station, Anuradhapura, from January 23; Mr. D. T. J. Weerasuriya to Veyangoda; and Mr. A. B. Attygalle to Godakawela from July 15; Mr. P. A. Gooneratne as Agricultural Instructor from September 26, *vice* Mr. B. G. Buultjens resigned; Mr. M. B. Boange as Agricultural Instructor, Gampola, from October 1, *vice* Mr. C. W. Danganamuwa resigned; Mr. G. de Silva as Agricultural Instructor, Matale North; Mr. V. G. Perera as Agricultural Instructor, Matale South; and Mr. P. B. Kapuwatte as Agricultural Instructor, Matale East, from October 1; Mr. K. T. E. de Silva as Agricultural Instructor, Panadure, from July 15; Mr. M. J. A. Karunanayake, Agricultural Instructor, Matara, was again seconded for service in the Ceylon Spinning and Weaving Mills from September 25 to November 30.

Research Branch.—Mr. B. A. Pereira as Sub-Inspector, Plant Pests Inspectorate (Southern), and Mr. K. T. E. de Silva, Probationer, to Plant Pests Inspectorate (Central) from January 1; Mr. G. V. Wickremasekera as Assistant to the Economic Botanist from July 16, *vice* Mr. H. L. Van Buuren deceased.

Field Branch.—Mr. D. W. K. Goonewardene as Gardener, King's Pavilion; Mr. R. Siriwardene as Gardener, Queen's Cottage, from February 21; Mr. K. J. A. Sylva as Assistant Curator, Henaratgoda Garden, *vice* Mr. D. F. de S. Gooneratne retired; Mr. E. Perera as Foreman, Peradeniya Gardens; and Mr. P. J. Christoffels as Foreman, Hakgala Garden, from September 1.

Retirements.—Mr. D. F. de S. Gooneratne retired from the service from September 1; Siripina, Gardener, from April 1; and M. Peter, Museum Peon, from September 21; Mr. C. W. Dangamuwa, Agricultural Instructor, resigned his appointment on September 1; Mr. B. G. Bultjens, Agricultural Instructor, resigned his appointment on September 30; Messrs. L. Abeyesundera and F. D. Peiris, Probationers, resigned their respective appointments from June 1 in order to proceed to India for higher training; Mr. L. B. Kapuwatte, Clerk to Divisional Agricultural Officer, Central Division, was dismissed from October 24; Mr. K. R. Samaratunge, Clerk in the Central Seed Store, was discontinued from service from October 31.

April 30, 1924.

F. A. STOCKDALE,
Director of Agriculture.

ANNEXURES.

I.—REPORT ON THE WORK OF THE DIVISION OF BOTANY AND MYCOLOGY.

MYCOLOGY.

MYCOLOGICAL specimens sent in for examination during the year numbered 437. Of these, 159 were tea, 94 *Hevea*, 34 coconut, and 46 miscellaneous fungi, chiefly from *Hevea* and tea. The remaining specimens included acacia, albizzia, aleurites, amherstia, areca, artichoke, begonia, betel, brinjal, cacao, callitris, cherimoyer, chillies, choisya, citrus, coffee, cotton, cupressus, cyamopsis, dadap, durian, grenadilla, grevillea, mango, mangosteen, paddy, papaw, plantain, potato, rose, soy bean, tephrosia, tobacco, tomato, vanilla.

Visits have been made by the staff to the Nuwara Eliya, Bandarawela, Uda Pussellawa, Dolosbage, Polgahawela, Kurunegala, Kegalla, Matale, Wattagama, Bentota, Elpitiya, and Balangoda districts in connection with the investigation of diseases.

HEVEA.

Leaf fall and pod diseases were prevalent during the prolonged rains. Mr. Gadd has made a comparative study of the *Phytophthoras* on *Hevea*, cacao, breadfruit, papaw, *Dendrobium*, and *Odontadenia*, and has found that although there are differences between the strains from different plants they are all to be regarded as biological forms of one species, viz., *Phytophthora Faberi*; all of them can attack *Hevea* fruits.

Fomes lucidus, which causes root disease of coconut and other palms in Ceylon, has been found on *Hevea* roots, under conditions which suggest that this fungus can similarly attack that plant, and an investigation of this has been begun.

Dr. Bryce and Mr. Gadd have made another detailed investigation of the original and renewed bar of the descendants of the *Hevea* tree, Henaratgoda No. 2, in relation to the yields of the second-year's tapping.

TEA.

Dr. Bryce carried out investigations on the Witches' Broom disease of tea until the time of his departure from the Island.

The tea seed crop of 1923 was to a large extent a failure. This was the case, not only on the western side of the hills, where it was usually attributed to the excessive rainfall, but also on the eastern side, where the normal dry weather prevailed. In the latter case, failure appeared to be due to the retention of the seed in the husk until it had lost its germinative capacity, owing to the fact that the husk did not dry and split when the seed was mature.

Brown Blight was sent in frequently during the year, and *Cercospora Theae* from June onwards. *Macrophoma Theae* Spesch., a leaf fungus first found in the Caucasus, was recorded for the first time in Ceylon. A *Coniothyrium* was found on tea leaves and a *Phomopsis* on tea twigs.

COCONUTS.

The number of disease specimens of coconuts has shown an increase during the year, though the majority have been merely Gray Blight. The increase, however, indicates a more general interest in the diseases of this crop.

Mr. Gadd has continued observations on the fall of immature nuts, and the effect of spraying on nutfall. The *Phytophthora* nutfall has not been found during these investigations, and the nutfall observed appears to have been due solely to physiological causes. As would be expected in these circumstances, the experiments in spraying with Bordeaux mixture did not show any definite advantage.

COTTON.

Several specimens of diseased cotton plants were received, the principal one being the leaf, stem, and boll disease caused by *Bacillus Malvacearum*. The latter was responsible in several instances for the premature splitting of the bolls. Root and collar rots due to *Fusarium* and *Rhizoctonia* were also recorded.

DADAPS.

During the prolonged rains, the green branches of dadaps in up-country districts began to rot, the fungi present being in some instances a *Fusarium* and in others a *Glæosporium*. Specimens from Uva were apparently attacked by a leaf disease.

MISCELLANEOUS.

Pink disease (*Corticium salmonicolor* B. & Br.) was found on an apple tree at Hakgala.

Brown root disease was recorded on *Tephrosia candida*.

Specimens of areca fruits from the Kegalla District were attacked by *Phytophthora omnivora* var.

Areca. This is the first record of this South Indian disease in Ceylon.

Cherimoyer trees at Hakgala were affected by a dieback associated with a species of *Dothiorella*.

A preliminary examination was made of the disease of paddy known as senthal in Jaffna.

Black leg of tobacco in Jaffna was found to be caused by *Bacillus Solanacearum*.

Mosaic disease occurred on brinjals (*Solanum Melongena*).

Mr. Bertus has been engaged on the investigation of the fruit rots of chillies.

Mr. Rangunathan has carried out investigations of the stem and leaf rot of vanilla, but these have been delayed by the non-appearance of the disease on the vanilla plot this year, notwithstanding the abnormal rains.

BOTANY.

306 specimens of flowering plants were sent in for determination. A large number of these were indigenous leguminous plants which it was thought might be used as green manure and cover plants, and to prevent wash.

The "new" weeds which have attracted attention during the year have been indigenous plants, *Drymaria cordata* appears to be spreading on up-country estates, while some estates in the low-country have complained of *Spermacoce ocymoides*, a species which has hitherto been regarded as rare in Ceylon.

Evidence on vegetable exhibits was given before the Supreme Court at Galle; and identifications of exhibits in other cases were furnished to the Government Analyst.

Now that scientific institutions in Europe are settling down to normal conditions, requests for botanical material for investigation are increasing, and several have been complied with during the year.

Mr. Livera has begun an investigation of Ceylon *Dipterocarpaceæ*, and has written a paper, now in the press, completing the descriptions of several species, of which adequate material had not previously been available. In connection with this work, and general collection of specimens, Mr. Livera has made collecting trips to different parts of the Island.

PUBLICATIONS.

The following publications, written by the staff of this division, have appeared during the year:—

The Toxicity of Lime to *Fomes lignosus* Klotzsch, by G. Bryce, Bulletin No. 64.

Experiments with the Green Muscardine Fungus on Rhinoceros Beetle Larvæ, by G. Bryce, Bulletin No. 65.

Experimental Errors of Field Trials with Hevea, by C. H. Gadd, Bulletin No. 66.

January 28, 1924.

T. PETCH,
Botanist and Mycologist.

II.—REPORT ON THE WORK OF THE ENTOMOLOGICAL DIVISION.

REPORT OF THE ACTING ENTOMOLOGIST.

THE specimens received for examination and report during the year numbered 254, of which 35 per cent. were pests of tea, while other specimens were pests of coconut, cotton, green-manure trees, paddy, cacao, fruit trees, rubber, tobacco, arghan fibre plants, plantains, coffee, sugar cane, ornamental plants, stored products, grass lawns, and numerous vegetable and miscellaneous plants.

ITINERARY.

Visits were made by the staff to estates in the following planting districts:—Badulla, Dimbula, Galle, Haputale, Kandy, Kurunegala, and Passara, 103 days being spent on circuit.

Mr. Jardine, while acting as Assistant Entomologist, attended the Entomological Conference at Pusa during February.

COLOMBO FUMIGATORIUM.

During the year under review 841 packages were dealt with at the Colombo fumigatorium; of this number, 507 were fruit, 296 garden plants and seeds, and 38 arghan fibre plants. Owing to the importation of tea seed from India having been prohibited there has been a reduction in the number of consignments received at the fumigatorium. The Acting Entomologist inspected the fumigatorium in November.

INSECT PESTS.

Tea.

The chief insect pests of tea have been termites, particularly *Calotermes militaris*, *C. dilatatus*, and the scavenging termites *Termes obscuriceps* and *T. redemanni* in association with branch canker fungi. Experiments are in progress on several estates with the object of discovering a substance which, when applied to the bushes after pruning, will prevent further decay of diseased wood and repel attack by termites. It cannot be claimed that these experiments have been attended by any success up to the present.

The investigations in connection with shot-hole borer (*Xyleborus fornicatus*) have been continued. The experiments which have been in progress at Sarnia estate, Badulla, since 1920 have now been concluded, and they have demonstrated the value of manuring in the control of this pest. Further experiments with individual manures have been commenced on New Peradeniya estate in order to check and confirm the results already indicated in previous experiments.

The castor trap-tree experiments failed to indicate any reduction in the numbers of this beetle in the interplanted area and have been discontinued.

This division is particularly indebted to Mr. C. H. Gadd of the Mycological division who has kindly undertaken the statistical interpretation of the results of the shot-hole borer experiments.

Of the leaf-eating caterpillars, tortrix (*Homona coffearia*) continues to cause considerable damage in certain localities. Few attempts have been made to establish flight breaks preparatory to controlling this pest by spraying with lead-chromate-rosin compound. The tea pyralid (*Piesmopoda rufimarginella*), recorded last year as a new pest of tea, has again been reported from the Kotmale and Badulla Districts, and is apparently common on one estate in the latter district. Hymenopterous parasites have been bred from the larvæ. Nettle grubs, *Natada nararia*, and *Thosea cana* have been recorded from the Passara and Kalutara Districts. A serious outbreak of the former was entirely controlled by the "wilt" disease. Numerous reports have been received of attacks by *Nygmia (Euproctis) flava*, in the Badulla District. The caterpillars cluster together on the older leaves but the damage caused is not serious. This insect has been recorded as a pest of castor plants and roses, but has not, hitherto, been reported as attacking tea, and its life-history has been investigated. Small outbreaks of "red-slug" (*Heterusia cingala*) have occurred in some districts.

The green bug, *Coccus viridis*, and the brown bug, *Saissetia hemisphærica*, have again been prevalent, particularly in the Haputale district. The damage occasioned on one estate in this district is considered to be serious and to be the cause of a reduction in crop.

Coconuts.

The coconut leaf caterpillar (*Nephantis serinopa*) has been reported for the first time from Jaffna, Kelani Valley, Badulla, and Peradeniya. It is considered to be spreading in the Polgahawela district, but where control measures have been adopted this pest has been kept in check; but fresh outbreaks have occurred due to the unrestricted development of the pest on neighbouring untreated estates. Special visits have been made to this district to advocate the adoption of a co-operative campaign against this pest.

An important outbreak of the paddy swarming caterpillar (*Spodoptera mauritia*) occurred on a coconut estate in the Eastern Province, 3,500 palms being severely damaged and 300 palms totally destroyed. This is the first recorded instance of this pest attacking coconuts.

Among other pests of coconuts which have been reported were the rhinoceros beetle (*Oryctes rhinoceros*), a weevil (*Diocalandra frumenti*), the Psychids (*Acanthopsyche cana* and *A. hypoleuca*), *Elymnias fraterna*, *Narosa conspersa*, and the spotted locust (*Aularches miliaris*). Investigations into the life-history of the latter pest have been continued by Mr. Alwis, Field and Laboratory Assistant.

Paddy.

Several outbreaks of swarming caterpillar (*Spodoptera mauritia*) occurred in the Eastern Province during the latter months of the year. Other pests reported were crickets (*Liogryllus bimaculatus*), the leaf-folding caterpillar (*Marasmia bilinealis*), and the Chrysomelid *Oides affinis*. Investigations of the paddy bug (*Leptocoris varicornis*) has been continued in the laboratory by Mr. Austin, Assistant in Entomology.

Cotton.

An outbreak of the cotton leaf caterpillar, *Cosmophila erosa*, occurred on cotton in the Southern Province during November, and the boll-worm (*Earias* sp.) was also reported from the same Province. The leaf-folder (*Sylepta derogata*) caused damage to this crop in the Southern and North-Central Provinces respectively, and *Dysdercus cingulatus* was reported from the Sabaragamuwa and Central Provinces.

Cacao.

Cacao has been damaged by the stem borer (*Arbela quadrinotata*), the pod borer (*Dichocrocis punctiferalis*), and Cerambycid borers. Considerable damage was caused to a nursery in the Kandy District by the larvæ of *Euproctis* sp., *Helopeltis antonii* has also been reported.

Green-Manure Trees.

Tephrosia candida has been damaged by *Ceroplastodes cajani*, *Etiella zinckenella*, and *Aræcerus fasciculatus*; Dadap (*Erythrina lithosperma*) by *Cyclopelta siccifolia*, and the stem borer (*Terastia meticulosalis*); *Albizia* sp. by the nettle grub (*Thosea cana*) and bag-worms (*Psychidæ*); and *Gliricidia maculata* and *Leucaena glauca* by the Coccid *Pseudococcus virgatus*.

Vegetables.

Pests of numerous vegetables have been reported and have been the subject of special investigation by Mr. Austin. Vegetable plots have been laid out near the laboratory to facilitate the study of the pests of the more important vegetable crops.

Miscellaneous Plants.

Citrus plants have been attacked by the fruit-fly *Dacus ferrugineus* and in some cases defoliated by the larvæ of *Papilio polytes*. The plantain root-borer (*Cosmopolites sordidus*) continues to cause considerable damage to plantains in the Rambukana and Matale Districts and the stem-borer (*Odoiporus longicollis*) has also been reported. Tobacco was damaged at Jaffna by the stem-borer *Phthorimæa heliopa*. Coffee pests were green bug (*Coccus viridis*), red-borer (*Zeuzera coffeæ*) and the scolytid (*Xyleborus compactus*). Considerable areas of pasture were stripped by the larvæ of *Pachyzancla phaeopteralis* during December and grass lawns were damaged by the same caterpillars.

Pests of a large number of ornamental plants have been received and reported upon.

Other Pests.

Tea mites particularly *Tetranychus bioculatus*, *Tarsonemus translucens*, and *Phytolptus carinatus* have been prevalent in some districts. The eel-worm (*Heterodera radiculicola*) caused damage to young plants in an up-country tea nursery. The snail, *Achatina fulica*, continues to invade new districts, but the prevailing belief in the Kandy District is that it is less in evidence than formerly. The investigations into the habits of the glow-worm (*Lampyrophorus tenebrosus*), an enemy of this snail, have been continued by the Entomologist and Mr. Austin, and an account of the life-history and habits of this insect is to appear as Bulletin No. 60, now in the press.

Complaints regarding the annoyance caused by land leeches (*Hæmadipsa zeylanica*) on lawns and golf greens have been referred to this office, and preliminary experiments have been commenced to find an economical spray which will destroy the leeches without injuring the grass.

EXHIBITIONS AND SHOWS.

Twelve large coloured posters illustrating the life-history stages of, and typical damage caused by, the principal insect pests of tea, coconuts, paddy, and cotton have been prepared by the draughtsman, Mr. G. L. de Silva, for the British Empire Exhibition.

Exhibits of the insect pests of the chief crops, represented by mounted and living specimens were sent to the Gampaha and Kandy Agricultural Shows during the year.

GENERAL.

Several consignments of Ceylon wild lac *Tachardia albizziae* and *T. conchiferata* have been forwarded to Professor Fowler of the Indian Institute of Science, Bangalore, who is making a special study of these Coccidæ.

Mr. Austin has been appointed a lecturer in Entomology at the School of Tropical Agriculture, Peradeniya, and has delivered several lectures to first- and second-year students during the year.

PUBLICATIONS.

In addition to several articles contributed to the "Tropical Agriculturist," the following publications have been prepared by the staff of this division during the year :—Notes on Termites attacking Tea in Ceylon, by J. C. Hutson, Leaflet No. 24; A Preliminary List of the Pests of Cultivated Plants, by the Staff, Bulletin No. 67; Notes on the Habits and Life-history of the Indian Glow-worm, by J. C. Hutson and G. D. Austin, Bulletin No. 69.

February 1, 1924.

F. P. JEPSON,
Acting Entomologist.

III.—DIVISION OF PLANT PESTS AND DISEASES INSPECTION.

CENTRAL.

THE following table indicates the inspection which was made during the year :—

		Estates.	Gardens.	Nursuries.	Acreage.	Total No. of Days.
N. K. Jardine	..	34	..	—	2	.. 75
J. Jackson	..	48	..	1	6	.. 56½
M. R. M. Jebaratnam	..	70	..	191	1	.. 173½*
K. T. E. de Silva	..	—	..	—	2	.. 2½
J. de Zilva	..	5	..	4	8	.. 11½
		157	196	19	47,793	319

* Thirty-four days occupied in shot-hole borer investigation.

The number of estates scheduled for shot-hole borer was 72, and gardens 206.

The number of permits issued during the year was 211, totalling 2,093,500 plants. These plants were sold from 64 nurseries.

ENTOMOLOGICAL CONFERENCE AT PUSA.

The Inspector proceeded to Pusa, India, on January 29, to represent Ceylon at the Fifth Entomological Conference, and returned on February 20.

He continued to act as Assistant Entomologist, in addition to his own duties, from January 1 to July 19, on which date the Assistant Entomologist resumed duties from leave. Also eight days in October during the absence of the Assistant Entomologist on sick leave.

AGRICULTURAL MEETINGS.

Meetings.—The following meetings were attended :—District Agricultural Committee Meetings : Matale—May, September, and November; Kandy—September and November; Kegalla—July. Estate Products Committee Meetings : May and November; Planters' Association : Kotmale—July.

INSECT PESTS.

Shot-hole Borer.—There is evidence that this pest is extending its area of attack. During the year several new cases have been recorded in Dikoya, where there are now altogether 20 estates scheduled as infested areas. Two additions have had to be made in the Maturata district, which now numbers 11 infested areas.

Tea tortrix was general again this year. It appears to be on the increase in the low-country; practically all estates in the Kelani Valley having reported it. During the last two and a half years experiments have been made on two estates in the Maskeliya valley to ascertain if tea, when allowed to grow up, will form satisfactory flight breaks. Owing to the lack of uniformity of jat on the estates they have proved disappointing, as large and numerous gaps appear in the breaks. It is now considered that such tea cannot function as an adequate flight break. Trials of quick and thick growing plants of manurial value will be made during the next few years.

Helopeltis has been recorded on eighteen tea estates during the year.

Termites.—*Calotermes militaris* does not appear to be prevalent this year as in previous years. There have been but ten records of it, as against fifty-five in 1922.

Red borer has been recorded as serious on sixteen estates.

Dadap borer continues to be an annoyance and is general throughout the Central Province.

Toona borer has been very prevalent wherever this tree is grown.

DISEASES.

The plantain root borer has caused anxiety to cultivators. There is little doubt this insect is a serious menace to plantain cultivation. Leaflets on the subject are being published in English and Sinhalese.

A bacterial disease of betel vine has been prevalent in the Kegalla District. The Inspectorate took the matter up and issued reports of remedial measures to the Agricultural Instructor and instructions to schoolmasters.

EDUCATION.

Posters of shot-hole borer in Sinhalese were distributed in the Kotmale district. This type of posters is well received and of great educational value.

The pests and diseases recorded during the year have been enumerated in the monthly reports and need not be recapitulated.

NIGEL K. JARDINE,

Inspector for Plant Pests and Diseases (Central).

January 18, 1924.

SOUTHERN.

During the year the main circuits made were in the Galle, Matara, Tangalla, Kelani Valley, and Ratnapura Districts, and total as follows:—A. T. Reeve 67 days, M. S. Mendis 29 days, B. A. Pereira 171 days, R. A. Cameron 51 days, and L. J. P. Perera 28 days.

INSPECTION OF ESTATES.

In all 276 estates were inspected with an approximate acreage of 70,000.

Shot-hole borer inspection work for the low-country was finished early in the year and 44 estates were reported as being infested with this pest. Most of these estates had been previously scheduled.

On completion of this work, attention was paid to some of the smaller rubber estates in the Kelani Valley district and good progress was made in this work. Proprietors did not appear to be keen at first, but after the object of the work had been explained to them a certain amount of keenness did develop and return visits were requested.

WATER HYACINTH ERADICATION.

A thorough inspection of the tanks in the Tangalla District was made during the drier south-west monsoon. In all 140 tanks were inspected and, on the whole, it may be said that there is a decided improvement in the condition of most of these tanks since last year. A few of the more heavily infested tanks previously noted still contain a considerable amount of the weed, but this should be considerably decreased with the systematic weeding now being carried out.

COCONUT BEETLE IN WELLABODA PATTU.

During the last three months of the year a careful inspection of coconut estates and gardens was made in the Wellaboda pattu to ascertain the severity of rhinoceros beetle and red weevil attack on the palms. In accordance with Ordinance No. 6 of 1907 all proprietors were circularized and ordered to clean up their estates. This cleaning up was carried out in most cases, but it was found necessary to institute three prosecutions, one of which was successful.

BROWN BAST CENSUS IN KELANI VALLEY.

A census of Brown bast trees was made during the latter part of the year on a Kelani Valley estate. Three separate blocks of 1,000 trees each were examined and the results have been embodied in a short report for the Yearbook.

PESTS AND DISEASES.

The most noticeable disease in rubber during 1923 was the heavy attack of pod rot and secondary leaf-fall experienced in all the low-country districts owing to the heavy and continuous rain. The other *Phytophthora* diseases, viz., Claret canker and bark rot were also common, but no other heavy outbreaks of disease were noticed.

A moderately heavy attack of tea tortrix was noted on one low-country tea estate, but other pests were normal for the year. As a root disease, diplodia still takes a heavy toll of tea bushes, more especially on those estates where albizzias have been cut out at ground level.

In some of the older *Tephrosia candida* heavy attacks of *Ceroplastodes cajani* and *Irpex subvinosus* were noted and also attacks of *Arbela quadrinotata* in Albizzias.

A. T. REEVE,

Inspector for Plant Pests and Diseases (Southern).

January 21, 1924.

IV.—REPORT OF THE GOVERNMENT CHEMIST.

THE total number of analyses was 121, apart from the numerous samples of cabook analysed in connection with investigations regarding the manufacture of alum.

LIMESTONES.

The analytical work included further analyses of limestones from different parts of the Ceylon tea districts with a view to ascertain their suitability or otherwise for the manuring of tea or other products. Most are dolomitic in character and, as a rule, are quite suitable for application to tea, either for forking in with prunings or for dusting over or whitewashing bushes to remove moss and lichen. At Nalanda Experiment Station and at Delwita, limestones occur with only 3·5 to 7 per cent. of magnesia present. In districts where transport from Colombo would be heavy, a considerable saving of expense is effected and the results appear quite satisfactory.

SOILS.

Several analyses have been made of what are considered the best tea soils in Ceylon, both as regards yield and quality of tea. The most marked characteristics of these soils, compared with soils from the same estates where yield is poor, are as follows:—

- (1) A uniformly high proportion of clay, silt, and humus ranging from 38·4 to 48·2 per cent.
- (2) A high power of water absorption ranging from 41·0 to 66 per cent.
- (3) A high but variable nitrogen content from 0·252 to 0·627 per cent.
- (4) A high potash content from 0·239 to 0·386 per cent.
- (5) Phosphoric acid ranging from 0·115 to 0·154 per cent.
- (6) A ratio of lime to magnesia of about 1·5 to 1·0 and in one instance 1·0 : 2·0.
- (7) A markedly acid reaction in every case.
- (8) The invariable presence of a considerable amount of lower oxide of iron.

The available potash and phosphoric acid varied considerably and did not entirely correspond with the yields per acre. The available potash ranged from 0·008 per cent. to 0·014 per cent., and the phosphoric acid from 0·003 to 0·015. Both of these were high in a soil yielding 1,211 lbs. of made tea per acre, which had been systematically manured for several years, although the soil composition was good.

From the average weight of 3,100,000 lb. for the top foot of dry soil per acre, 0·015 per cent. of available potash or phosphoric acid is equal to about 465 lb. of either constituent, so that manuring with these ingredients at 30 to 50 lb. per acre would hardly appear to be necessary.

The weight of soil per cubic foot varied from about 60 lb. to 71 lb., one of the best yielding soils being 62·5 lb. per cubic foot or 2,722,500 lb. one foot deep over an acre.

The actual depth of soil is over two feet, but the plant food contained in the top foot of this soil is approximately:—

	lb.		lb.
Nitrogen ..	17,000	Phosphoric acid ..	3,820
Lime ..	6,500	Available potash ..	272
Magnesia ..	4,300	Available Phosphoric acid ..	326
Potash ..	10,500		

An average yield of 814 lb. per acre is maintained on this soil by small annual applications of artificial manure.

A similar yielding soil from the low-country contained only 28·1 per cent. of humus, clay, and silt. It was also rather poorer in nitrogen, potash, and especially phosphoric acid than the up-country soils, but contained the same proportion of lime and magnesia. The lower oxide of iron was unusually high for the low-country and the acidity was equally marked. The available potash and phosphoric acid was the same as in some of the up-country soils.

A poor yielding soil from this estate where the yield was less than one third of that from the best soil, contained less than one-fifth the actual humus, half the nitrogen, and little of the lower oxide of iron, while the available potash and phosphoric acid were the same. The soil besides being deficient in humus, had more gravel and was more easily dried out.

CABOOK.

An investigation has been made of the light coloured laterite or cabook prevalent on the slightly raised lands in Colombo and the surrounding districts.

The material is a type of bauxite very similar in composition to the Irish bauxites and differs from the kaolin or white clay also found in the district.

The composition of the crude cabook varies to some extent, but the fine material obtained by washing the pale cabook is more uniform, the composition being approximately:—

	Per Cent.		Per Cent.
Combined water ..	12-13	Silica ..	48-60
Free alumina ..	30-38	Titanium oxide ..	1-2

On treatment with sulphuric acid, practically the whole of the alumina dissolves forming crude sulphate of alumina and leaving an exceedingly finely divided residue of silica. From the sulphate of alumina practically pure ammonia or potash alum can be made with one or two crystallizations, the yield of alum varying from 2 to nearly 3 tons from one ton of the washed silt.

A method for the separation of the titanium oxide, and the production of the pure alum has been worked out, and samples of the material and products at different stages have been sent to the British Empire Exhibition.

Pure alumina for the production of aluminium can be prepared at a reasonable cost from the aluminium sulphate or alum, so that when the hydro-electric power is available a large consumption of the power should be assured.

Experiments on the manufacture of the fire bricks from the washed material containing a low proportion of iron are being made.

The residue of finely divided silica should find numerous uses as a polishing powder or for incorporating in paper and rubber.

TEA.

A series of analyses have been made of the ash from leaves and branches of prunings from the experimental tea plots to ascertain how far the ash is affected by manurial treatment.

The average percentage of ash is much higher in the leaves than in the twigs, viz., 6.48 per cent. to 2.51 per cent.

Lime is the chief constituent and is higher in the leaves, viz., 36.06 per cent., against 28.4 per cent. in tea twigs. Magnesia is 11.01 per cent. to 10 per cent. in the twigs.

Potash.—This is the chief ingredient in young leaves, about 32.6 per cent., but it is greatly reduced in the old leaves, and has accumulated in the wood. The average percentage of potash on the ash in the old leaves is 16.09 per cent. and 25.12 per cent. on the woody portions, which confirms previous analyses of prunings from these plots.

Phosphoric Acid.—This is about half the amount found in young leaves, but there is no marked difference in the proportion in old leaves and wood, viz., 7.18 per cent. and 8.43 per cent.

A characteristic of all tea ashes is the amount of manganese present; a constituent associated with the enzyme in the leaves.

A varying amount of alumina is also found to be present, probably due to the fact that the acidity of most tea soils is due to the presence of soluble aluminium compounds. Further investigation *re* these two constituents is being continued.

The amount of potash in the ash in the nitrogen and potash plot was not increased, but the amount of phosphoric acid was increased in all the plots receiving this ingredient.

In the dadap plot both the phosphoric acid and potash in the prunings ash were below that found in the manured plots.

TANNINS.

Five samples of acacia bark including *A. dealbata*, *A. decurrens*, and *A. mollissima* were examined and were found to contain from 23.6 per cent. to 36.2 per cent. of actual tannin. The highest was from *A. decurrens* 5½ years old and *A. mollissima* 7¾ years old.

RUBBER.

Several samples of smoked rubber sheets were examined which were badly marked with bubbles. Keeping utensils perfectly clean and sterilized, and rather more rapid coagulation and removal of the rubber from the serum was advised. Also the non-tapping of immature trees.

MISCELLANEOUS.

A sample of coconut waste from Mr. G. Pandithasekera was examined for manurial value. It contained 2.46 per cent. nitrogen giving a value of Rs. 53 per ton, compared with a 7 per cent. groundnut cake at Rs. 150 per ton.

Analysis of three samples of cattle manure and ash from Nainamadama were made. The nitrogen varied from 0.87 to 1.89 per cent. calculated on the sun-dried material. Phosphoric acid averaged 2.11 per cent. on two samples and only 0.32 per cent. in the third, which contained much sand. Potash averaged 1.47 per cent. in the three samples.

A sample of bats' guano received from the Southern Division contained over 9 per cent. by weight of living grubs of tenebrionids, which are said not to be harmful to living plants.

The guano contained 6.90 per cent. nitrogen, 4.60 per cent. phosphoric acid, and 2.16 per cent. potash, forming a valuable slow acting manure. Its value is approximately Rs. 179 per ton.

Manurial recommendations were made for tea seed bearers and in connection with shot-hole borer. The former was an insoluble mixture containing 4.7 per cent. nitrogen, 19.1 per cent. phosphoric acid, and 8.0 per cent. potash. For the latter, rather more available manures for the second and third applications were recommended to insure a free flow of sap from pruning to pruning.

A sample of cacao liquor was found to contain 0.26 per cent. dextrose, 6.1 per cent. absolute alcohol, and 1.18 per cent. acetic acid.

A special apparatus, on up to date lines, for the manufacture of vinegar from this kind of liquor was made and sent to the Experiment Station for trial.

A paddy soil from Southern Division on which the paddy was thought to be suffering from a root disease was examined. Chemically it was in no way deficient, but it contained much soluble iron and was unusually acid. The presence of the lower oxide of iron, which in excess is poisonous, was the probable cause of the wilting. A heavy application of lime at 1 ton per acre was advised and better drainage and soil aeration if possible.

CITRONELLA OILS.

A large number of samples were examined and found to contain alcohol in addition to kerosine, the former being added to enable the oil to pass Schimmel's test. Monthly imports of methylated spirit from Singapore and Java showed a great increase from March to August, when the adulteration was causing a considerable scare. From that date the imports rapidly fell off, and from other evidence there is no doubt this imported spirit had been largely used for adulteration.

Steps are being taken to try and prevent adulterated oil leaving the Island, and there is a tendency to sell entirely on the basis of the Geraniol content, which would insure a purer oil.

This is already done in Java, the minimum total Geraniol content being 85 per cent. with a pure Geraniol content of 25·6 to 28·0 per cent.

In Ceylon the standard would have to be lower for the Iena-batu oil. The average Geraniol content of a large number of samples from 1919 is as follows :—

1919, 61·3 per cent. ; 1920, 61·5 per cent. ; 1922, 57·36 per cent. ; 1923, 56·94 per cent.

FODDER GRASSES.

Four varieties of fodder grasses from the Government Experiment Station have been analysed, including Efwatakala (*Melinis minutiflora*), kikuyu, and Napier grass (*Pennisetum purpureum*). They contained respectively 71·9, 73·8, and 65·3 food units and nutritive ratios of 1 : 5·2, 1 : 5·5, and 1 : 4·2.

KURAKKAN AND OTHER GRAINS.

Eleven samples of varieties of kurakkan were analysed fully for food values. There was no marked difference in any sample, and an average composition showed 1·65 per cent. oil, 7·68 per cent. proteids, and 72·22 per cent. carbohydrates. The total food units average 95·8 and the nutritive ratio 1 : 9·87.

Three visits were paid to the Chilaw Coconut Experiments and one to inspect coconut lands near Puttalam.

M. KELWAY BAMBER,
Government Agricultural Chemist.

V.—REPORT OF THE DIVISION OF ECONOMIC BOTANY.

PADDY.

THE main tenor of work has been one of consolidation throughout the year. For both seasons, the selected strains were sown down and transplanted into plots of standard size as for the previous year.

The grain store and field laboratory sanctioned for the Anuradhapura station are nearing completion. Storage room for the produce from 30 acres is provided, with separate outside floors for stacking and thrashing work. The old temporary building will be pulled down.

Great difficulty has been experienced in the disposition of seed of the selected types to the appropriate districts. The effect of climatic and environmental change has caused disappointment in several cases, and it is felt to be a very hazardous undertaking to move seed paddy from one district to another. Though splendid crops have been grown at the experiment stations, these can seldom be repeated by cultivators in other districts. It has therefore been decided to adopt an altered policy for these trials, whereby many of the disadvantages of centralization may be eliminated. Samples of widely grown paddies are being collected from the yala and maha crops in several centres, and they will be sown at the two experiment stations for extraction of line strains. These strains will be divided, one half being returned to the centre of origin for trial under the supervision of the Divisional Agricultural Officers, who will discard the less promising types ; the other half being retained for duplicate trial at the experiment stations. Seed of those strains which show an improvement on their local parental types can then be multiplied at the experiment stations for distribution. Conditions of soil, climate, and cultural operations differ so widely in Ceylon, that it is impossible to select successfully at two central stations for a wide area, and probably many types have been discarded for poor yielding performance that would have been valuable in their native environment. It is hoped that this altered policy will more nearly meet the requirements of the cultivator, and other centres will be opened year by year. The cultivator will thus have the opportunity to watch the progress of the improvement of his local paddies, and will be able to decide for himself what advantage he is to gain by sowing grain of a selected type.

This policy has the further advantage, that the usual sowing date for the district may be maintained, with other local conditions of cultivation, &c. The danger of paddy fly makes it impossible to have an extended series of sowings in one block of fields, and at the experiment stations this has been a source of trouble, as there is no doubt that a paddy sown out of season does not, in many ways, conform to its usual habit of growth.

Samples of paddy are collected each year for record purposes. These are stored in tins. Many of these have been examined, relabelled, and the naphthaline renewed. The work has been slow, as old records have had to be traced for full information. Some 740 samples have been completed, and about 500 remain to be finished as time permits.

The paddy index of type-names is being kept up, and it is hoped that a preliminary list may be published shortly.

A demonstration of paddy manuring, seed selection, and methods of cultivation was arranged for the Gampaha Floral Festival in July, and some 200 headmen, cultivators, &c., were shown round the plots. Several cultivators tried transplanting as a result. Recurrent floods took a heavy toll, but the paddy stood out well amongst the neighbouring fields. Of the manurial plots, that treated with green leaf and bone dust (1½ cwt. per acre) gave the highest return of grain and straw, with a grain yield of 2,300 lb. per acre, whereas the untreated plot gave only 950 lb. per acre. Steamed animal meal on these plots gave disappointing results, being little better than the control. The advantages of green manuring were well shown. Amongst the other plots, germinated seed sown in drill rows 6 inches apart gave a grain yield of 4,700 lb. per acre. Seedlings transplanted at 6 inches spacing produced 3,200 lb. of grain per acre, and those transplanted 3–4 inches apart gave a return of 2,850 lb. of grain per acre. The broad casted plots of the same paddy (dewaraddiri) yielded only 1,600 lb. per acre.

Work of the Year : Maha Season, 1922-23.

(a) *Anuradhapura*.—Line selection plots of forty-four ma-wi and six samba paddies were harvested in February-March. The season was slightly below the average. The four local types did not produce plants of outstanding merit, and samples of tillanayagam and anaikodan only were taken for future work. The experiment to test the comparative effect of broadcasting, broadcasting and thinning, transplanting, and sowing at 6 inches intervals, was harvested. Results are to be found in the Yearbook of the Department. The tillanayagam ear-head block-tests produced some very sturdy plants.

(b) *Peradeniya*.—Line selection plots of twenty-six ma-wi and six samba paddies were harvested in February-March. The yields were somewhat disappointing, and showed great field-to-field differences. Six ear-head block-tests of local hatial were taken, but a deposit of iron leaking through the tank bund, produced a stunted growth, and accounted for several fatalities. The hill paddies started well, but suffered through lack of water, and became so choked with weeds that they were useless for performance records. No selection work was done on them.

Eight lines of the main series were harvested from the fields of the School of Tropical Agriculture.

Yala Season, 1923.

(a) *Anuradhapura*.—Material was again subdivided according to age, and each strain was transplanted into standard plots of 4 feet by 40 feet.

Series 1.— $4\frac{1}{2}$ months' duration. Nineteen selections were sown in March. Heavy rain followed, and a re-sowing was necessary a week later. Four repetitions of each were transplanted.

Series 2.— $3-4\frac{1}{2}$ months' duration. Lot A : Thirty-four selections were sown in April, including five on a slightly larger scale. Four repetitions of each were transplanted.

Lot B : Twenty-two selections were sown in April, including five on a slightly larger scale. Four repetitions of each were transplanted.

The maha fields were sown with sunn hemp, which was cut and buried with application of lime. The block of wild paddy was uprooted and transferred to an unused swamp.

(b) *Peradeniya* : Series 1.— $4\frac{1}{2}-5$ months' duration. Eighteen selections were sown in March and transplanted in four repetitions. Larger plots of four of these were filled in. Rain followed the sowings, but no damage was apparent.

Series 2.— $3-4\frac{1}{2}$ months' duration. Thirty-seven selections were sown in April and transplanted in five repetitions. Larger lots of nine of these were laid down.

A collection of twelve strains from British Guiana was sown to test the suitability to Ceylon conditions. They failed to set grain. Four strains sent from the Rice Research Station, Kaijat, Bombay, did not succeed, and it is felt that, when the correct sowing date is found, these paddies would do better. Four samples from Trincomalee and Kegalla were put in for extraction of types.

A 3 months' crop of bala-wi was broadcasted on the maha fields and carefully harvested in strips in order to estimate soil error.

Maha Season, 1923-24.

(a) *Anuradhapura*.—Fifteen ma-wi and two samba selections from the last maha crop at Peradeniya are being tried out under standard conditions. Forty-two ma-wi and six samba lines of the main series are also laid down in eight repetitions.

The cultivation experiment, mentioned for the previous maha season, is repeated. Line selection plots of tillanayagam, murungan, and anaikodan are sown, and a field is set aside for more local types.

Six strains from the Coimbatore Agricultural College have been transplanted. These were originally selected from Ceylon paddies.

(b) *Peradeniya*.—Eleven ma-wi and four samba lines are interpolated with local hatial, each being repeated, in half standard plots, 13 times. Six plots of selected hatial are in growth. In the yala area, 85 ear-head block-test plots of paddies suited to brackish water conditions are sown, but many of the young seedlings were washed out by rain on the second day.

VEGETABLE SECTION.

A further piece of land, rather less than an acre in extent, has been felled and cleared. Cattle have been turned on to graze. The land will come into cultivation in May, 1924, to try out some of the types evolved from the breeding plots.

Samples of kurakkan, brinjals, chillies, cowpeas, and snake-gourds are grouped on the plots in three series, according to origin, viz. :—(1) from moist low-country below 2,000 feet; (2) from dry tracts; (3) from above 2,000 feet. A fourth group is intended to include samples from other countries. Type drawings of all specimens are carefully recorded.

Brinjals.—Thirty-nine samples were selected for future work.

Chillies.—Twenty-six samples were retained.

Ants and crickets damaged the seedlings of these two crops, and re-sowing was necessary in many cases. From nursery beds, planted in rows 6 inches apart with 1 foot between the plants, the seedlings were transplanted into beds 10 feet by 7 feet at distances of $2\frac{1}{2}$ feet by $2\frac{1}{2}$ feet. The chillies from British Guiana mostly failed to germinate, and no fruit was harvested.

Snake-gourds.—Four beds of each type were sown, with four plants per bed in two hills. Jaffna white and long, slender types proved slow in growth.

Kurakkan.—District and time of sowing were deterrent features, resulting in stunted plants. A fresh collection is being made to be tried out in the dry zone.

VI.—REPORT OF THE CENTRAL EXPERIMENT STATION, PERADENIYA.

TEA.

THE whole tea area of $21\frac{1}{2}$ acres was pruned in October and November. A satisfactory growth of wood had been made since the severe pruning of the old plots in 1921. The manurial experiments in 11 acres of old tea were continued, the manures being applied in January. The estimated yield of made-tea from these plots was 8,400 lb. or an average of 763 lb. per acre. The highest yield of 1,068 lb. was obtained from plot 150, which was under Albizzias till 1921 and which has now been replanted with those trees; the second highest of 1,038 lb. from plot 149 under Dadaps. If these yields are calculated to 2,722 bushes per acre, the total yield is 10,386 lb. or an average of 944 lb. per acre, while the highest yield is given by plot 149 with 1,245 lb. per acre. The Dadaps in plot 144 were lopped three times and yielded 19,040 lb. of green material per acre. The young Dadaps in plot 149 yielded 3,910 lb. in one cutting. Comparative records of green material obtained from loppings of *Gliricidia* and Dadap trees of the same age in the half-acre tea plot showed that in two years the *Gliricidia* trees had yielded 13·6 tons of fresh green material per acre per year containing 2·7 tons of organic matter, while the Dadaps had yielded 7·2 tons containing ·7 tons of organic matter. The demand for *Gliricidia* cuttings has been maintained. The work of building permanent stone drains between the plots to prevent further soil erosion was continued. Plot 141–143 and the half-acre plot were supplied with basket plants during the south-west monsoon; most of these plants have come on well. Plots 146–150 were supplied with basket plants during the north-east monsoon. The incidence of shot-hole borer has perceptibly decreased. A census of bushes affected by shot-hole borer showed that the Dadap plots were less affected. Plot 164 under *Gliricidia* seemed somewhat more severely attacked than the neighbouring plots. The flourishing state of the tea market resulted in a revenue of Rs. 10,404·73 for tea alone. The leaf was manufactured for the station by New Peradeniya Estate.

RUBBER.

The manurial and tapping experiments detailed in the annual report for 1922 have been continued and separate reports for these have been published. Two changes were made in the manurial experiment.

- (1) The manures were applied in trenches running across the avenue of trees, instead of down them.
- (2) In the old manurial experiment the plot which had previously received the mixture containing an excess of potash received the mixture containing an excess of phosphoric acid and *vice versa*.

The rubber budding experiments mentioned in the 1922 report resulted as follows:—

- Deli (Java) method 91·66 per cent. successes.
- Square patch method 60·41 per cent. successes.
- Diamond patch method 50 per cent. successes.

The buds were obtained from the twelve best yielding trees in plots 14 and 15, which are grown from seed of No. 2 tree, Henaratgoda. Another 120 stumps were later budded and gave 81 per cent. successes by the Deli method, 60 per cent. by the square patch method, and 50 per cent. by the diamond patch method. The budded stumps were planted out in plot 165 and interplanted with *Gliricidia maculata*. They are making satisfactory growth.

The green manuring system in the new avenue rubber was reorganized, plants which had not done well or had died out being replaced by other varieties. The steep portion was sown with contour hedges, which however largely failed on account of heavy rain. The exceptionally wet season resulted in some trouble from bark rot, a disease from which the station has in the past been remarkably free. Pod and leaf disease also appeared to a slight extent. Two more trees were lost from *Fomes lignosus* in plots 151–154.

CACAO.

The exceptionally wet season resulted in an increase in disease and a poor crop. The total crop for the cacao year ending March 31, 1923, was 3·6 cwt. of dry cacao per acre. The manurial experiment in the “B” cacao area was continued, the manures being applied in April. A round of canker treatment was carried out in January and February; this consisted in light scraping followed by rubbing with copper sulphate crystals in plots 1 to 10, and complete excision of the diseased tissue in the remainder of the cacao. An examination of a number of trees treated by the former method showed that the disease had not spread from the treated patches. A light pruning preceded by a partial lopping of dadap shade was carried out in February and March. All the old cacao was deep forked in December, 1922, and January, 1923. Kalutara snails have been very much in evidence in the cacao, and are believed to cause considerable loss of crop by destroying flowers on the stems of the trees. An offer of Re. 1 per sack resulted in the collection and destruction of over two tons of snails from the cacao plots.

COFFEE.

Following an application of castor cake and ashes to all the old plots in January, 1922, the yields for the year ending September 30, 1923, showed a remarkable increase.

The yields for the Robusta types for 1921–1922 varied between 1·83 lb. and 2·31 lb. of fresh berries per bush and for 1922–23 between 3·99 lb. and 5·47 lb., an increase of over 100 per cent. in every case.

The yield for the Hybrid coffee was 5·41 lb. per bush in 1921–22 and 10·73 lb. in 1922–23.

Plot 140 E of Robusta coffee, which was collar pruned in June, 1922, was topped in June, 1923. The evenly formed bushes are bearing a crop in the 1923–24 season, but the form and fullness of the new bushes is somewhat disappointing and they have not been immune from dieback. If this method of pruning is tried again two suckers will be left instead of only one.

All the old coffee was lightly pruned and shade periodically lopped. In October the plots of young coffee of the Robusta types in the economic collection and in the Bandaratenne rubber were manured with cattle manure. Plots of Abeokuta, Excelesa, and Liberia Pasir Pogor were established in the economic collection: the young basket plants made a good start. The six-acre field planted in 1922, half with Jackson's Hybrid and half with Kent's Arabica, has proved disappointing. The young plants made an excellent start, but in the upper and more exposed portion leaf disease has appeared, and many casualties have occurred. Lack of sufficient shade is thought to be partly responsible and an additional row of *Leucaena glauca* between each row of *Gliricidia* was planted in December.

The retention of the lower two acres of these coffees and their replacement in the upper four acres by more vigorous varieties is contemplated. *Indigofera arrecta* was sown in May to form contour hedges and made good growth.

149 lb. of seed of the Robusta types was sold during the year, against 450 lb. in 1922 and 537 lb. in 1921.

16,919 plants were sold. The decrease in demand for seed can be partly accounted for by the fact that several estates are now selling seed. The flourishing state of the tea industry has also probably tended to decrease interest in new products.

The Kalutara snail was observed to damage coffee (1) by destroying the bark of young plants, (2) by eating the rind off ripening berries, (3) by eating the blossom. Periodical collections of snails were made in the coffee plots.

COCONUTS.

The crop from the old coconuts amounted to 25·2 nuts per tree, against 25·6 nuts per tree for 1922. The highest price realized for nuts at the auction sales was Rs. 63 per 1,000 nuts. The Java nuts planted in different positions in 1922 gave following germination:—horizontal, 6 out of 12; vertical, 10 out of 12; sloping at 45°, 11 out of 12. The plants have been planted out in plot 161 B in order that their subsequent growth and form may be studied.

The dwarf coconuts which made poor growth during the first two years are now progressing well.

Further nuts of the nineteen varieties originally received from Gate Mudaliyar A. E. Rajapakse were received during the year to supply vacancies in the fodder grass plots.

PADDY.

The majority of the paddy area was as usual utilized by the Economic Botanist.

In the remainder of the Panchikawatta fields a trial of sowing tillanayagam paddy under wet and dry cultivation was made. The crops in both cases were very poor. A large number of these plots are very swampy, and all appear unsuitable for paddy cultivation. It is proposed after draining to convert the plots to other uses, probably mainly the growing of fodder grasses. A trial of Tonkin mineral phosphate against bone meal was repeated.

FODDER GRASSES.

A report was published in September giving results of the trials up to August, 1923. The trials had then been in progress for two years. *Paspalum dilatatum* (the variety grown commonly on up-country estates) gave the largest number of food units per acre; the yield of this grass increased in the second year, while those of all the other grasses declined slightly. Rhodes grass (*Chloris gayana*) again proved the poorest, both in yield and feeding value; it must be borne in mind however that this plot is very sandy and is infested with couch and illuk.

The water grass plot had to be abandoned on account of a vigorous intergrowth of sensitive weed: illuk also became re-established in this plot and it will probably be necessary to spend a year in forking out this weed before the plot can be replanted. A newly established plot of kikuyu grass (*Pennisetum longistylum*) shared the fate of the water grass plot.

An acre plot was planted up with Napier's grass (*Pennisetum purpureum*). This grass promises to be a very heavy yielder, but the feeding value on analysis is somewhat poor. Shoots of a grass under the name of elephant grass (*Pennisetum purpureum*) were received from the Central Farm, Coimbatore: the grass however appears identical with Napier's grass. Another totally different grass originally received from the Stock Gardens as *Pennisetum purpureum* was reidentified by the Botanist as *Pennisetum purpurascens*. Seed of Efwatakala grass (*Melinis minutiflora*) was received from Kew Gardens. The grass, which is a hairy semi-erect plant resembling water grass, has made good growth and promises well. Seed of two varieties of Vetches (*Vicia sativa*) was received from Cyprus, but at present the plant shows no great promise of local utility.

CEREALS.

Trials of three American varieties of maize, Brazos white corn, United States selection 119, and Singleton strawberry corn were repeated in the annual economic area, but the yields were poor. The growth of "Adlay" (*Coix Jobi lachrymæ*) on the other hand was excellent; a plot of one-fourth acre yielded a crop of 69 bushels or 2,484 lb. of grain per acre and 22,060 lb. of straw. Some grain was distributed among the station employees, both Sinhalese, Tamils, and Muhammadans, who prepared the grain in several different ways. All expressed their approval of the grain as a food and several purchased further supplies. Eight further varieties of Adlay were received from the Philippines. The crops realized from this seed will serve for further trials in 1924. Buckwheat was again tried; it yields a crop in three months but the yield is poor.

TUBERS.

Comparative trials with a large number of varieties of sweet potatoes, maniocs, and dioscorea yams were continued.

It is proposed to obtain at least five reliable yields from each variety before publishing results. In order to allow the sweet potato trials to be brought to a conclusion first, the area of manioc has been reduced to one row of each variety.

FIBRES.

Plots of roselle, *Hibiscus sabdariffa*, varieties Altissima and Victor were established. The Victor variety has proved only suitable for the production of jam and jelly from the flower calyx. The plots of Altissima made excellent growth and yielded up to 1,970 lb. of clean fibre per acre of an average length of 10 to 11 feet. The fibre is strong and silky and shows great promise. A full account of these trials was written by Mr. H. A. Deutrom for the Departmental Yearbook. A nursery of Columbian Pita plants was established under shade in the fruit plots; though healthy the plants have made very slow growth.

GREEN MANURES AND COVER PLANTS.

Five creeping leguminous plants were added to the collection :—(1) *Indigofera endecaphylla* : This plant has formed an excellent cover and borne a large quantity of seed; propagation from cuttings has not proved successful. (2) *Vigna oligosperma* : This has formed an excellent cover, but has not yet flowered. Propagation by cuttings has so far failed completely. (3) *Centrosema pubescens* : The growth has been quicker than that of *Centrosema plumieri*; the plant is disposed to twine. (4) *Pueraria javanica* : Germination of seed was poor and growth slow but good progress was made later. (5) “Kudzu” (*Pueraria thunbergiana*) : A creeping vine well spoken of in Japan and America. The growth was poor.

The contour hedges of *Indigofera arrecta* in the hillside tea started to die out at the end of the year after 18 months' growth and three loppings. 13,650 cuttings of *Gliricidia maculata* were sold during the year and orders for 11,000 cuttings booked for 1924.

THE ECONOMIC COLLECTION.

Vacancies were supplied in the following plots :—Nutmeg, cloves, cardamoms, cinnamon, sandalwood, pepper, castilloa, rubber, *Ficus Vogelii*, lime, kola, sappan, mandarin, annatto, croton oil, divi-divi, and betel.

The following products have been added to the collection :—Grape fruit, sweet orange, nux vomica, vanilla, allspice, and tea from Mousakande, Kanapediwatte, Kotiyagala and Chapelton estates.

ROADS.

The metalling of the road leading round the coffee plots to Gannoruwa village was completed. A large quantity of foundation stone and metal was broken and a considerable length of foundation laid on the road running from the nurseries past the head kangany's lines to the Totadeniya paddy fields. A portion of this road was straightened and will have to be lowered.

GENERAL.

The exceptional wet season considerably hampered weeding. The position as regards couch and illuk at the end of the year was bad. The entire available male labour force was employed during November and December in forking out these weeds, although other works demanded attention.

The revenue of the station for the financial year ending September 30, 1923, was Rs. 25,171·14, the highest on record. Of this sum, Rs. 10,404·73 was realized from sale of tea.

The rainfall for the year was as follows :—

Rainfall.				Rainfall.			
Inches.				Inches.			
No. of Days in which Rain fell.				No. of Days in which Rain fell.			
January ..	..	14·86	.. 12	September ..	.. 10·03	..	18
February ..	..	—	.. —	October ..	.. 16·75	..	19
March ..	..	5·94	.. 9	November ..	.. 8·97	..	16
April ..	..	4·50	.. 10	December ..	.. 14·68	..	15
May ..	..	—	.. —				
June ..	..	18·97	.. 26	Total ..	116·08		172
July ..	..	8·96	.. 23				
August ..	..	12·42	.. 24				

T. H. HOLLAND,

Manager, Experimental Station, Peradeniya.

VII.—REPORTS OF DIVISIONAL AGRICULTURAL OFFICERS AND OF AGRICULTURAL INSTRUCTORS.

CENTRAL DIVISION.

DISTRICT AGRICULTURAL COMMITTEES.

THE four newly constituted Committees held the following number of meetings in 1923.—Matale 6, Kandy 2, Kegalla 2, and Nuwara Eliya 1. In future it will probably be found best to arrange quarterly meetings, one year in advance.

These Committees have proved of great value to the Divisional Officer as organizing centres. It is probable that they are equally useful to Revenue Officers as a means of keeping in touch with agricultural work in their districts. All regular lines of work, such as co-operative societies, school and home gardens, competitions, shows, experiments have been explained to the Committees, and in addition such matters as village irrigation, special crops, destruction of timber, &c., have come up for discussion.

There seems to be no reason against the gradual recognition of these Committees as centres in which general agricultural policies for the districts may be elaborated and carried out.

AGRICULTURAL SHOWS.

A district agricultural show was held in Kandy during Esala Perahera week, 1923, in connection with which Mr. H. J. L. Leigh-Clare, of the Kachcheri, and the Divisional Officer acted as Joint Secretaries; the surplus of Rs. 4,000 which resulted indicates that this show might be made a popular and useful annual event.

A village show was held at Dambulla in March. The success of this show was due to the energy and care of the Ratemahatmaya of Matale North, helped by Agricultural Instructor Boange.

Both of these shows were under the auspices of the District Committees. It is of course recognized that any private individual is at liberty to organize a show, but the organization annually of a definite programme of shows by the District Committees should go a long way towards increasing the value and stability of these activities.

The 1924 programme of shows has been worked out by District Committees and published in leaflet form.

AGRICULTURAL COMPETITIONS.

The following field competitions were carried out in 1923:—

	Kandy.	Matale.	Nuwara Eliya.	Kegalla.
Paddy cultivation	.. 3 ..	6	.. — ..	2
Vegetable gardens	.. 1 ..	2	.. — ..	2

The prize winners in these competitions numbered 38, and the total prize-money expended amounted to Rs. 1,055.

The inspection, advising, and judging in connection with these competitions entail much organization and work. Efficiently organized, however, competitions are probably the most direct means of effecting improvement in the agricultural methods of the villager.

Complete programmes for 1924 have been worked out by the District Committees and printed in leaflet form. The system has been extended so as to include tea, cacao, and cotton holdings.

EXPERIMENT STATIONS.

Nalanda Experiment Station contains 34 acres, of which 10 acres have been cleared and fenced: 1 acre has been banded for paddy trials. For part of the year Agricultural Instructor Boange was in charge of this station and for the remainder Agricultural Instructor G. de Silva. The chief trials were of cotton (5 varieties, 3 acres), tobacco (9 varieties, 3 acres), paddy (error trials on 1 acre), and sunn hemp (trial as green manure on 1 acre). Cambodia and Durango cottons gave best returns, and it should be possible to establish an industry in North Matale. Among the tobaccos, Maryland Mammoth, Mexican, and Adcock were the highest yielders.

An observation plot of half-an-acre was established in 1923 near Rambukkana, in order to obtain information regarding "bunchy top" disease of bananas. The land was kindly provided by Mr. Samarakkoddy, and the plot has been in charge of Agricultural Instructor Crispeyn. Five varieties of banana, each under four systems of treatment, have been established.

The need for adequate provision for carefully controlled experiments in other areas of the division still remains.

CO-OPERATIVE PADDY TRIALS.

The following manurial and transplanting trials with paddy have been carried out on village fields by the various Agricultural Instructors of the division:—

				Major Trials.	
				Maha, 1922-23.	Maha, 1923-24.
Kandy	..	..	..	1	5
Matale	..	..	..	2	4
Nuwara Eliya	..	..	..	4	4
Kegalla	..	..	..	4	7

In addition, about 50 minor trials were made.

In order to check errors due to soil differences, two triplicate trials have been laid down. These plots will be surveyed to eliminate the large errors, which have hitherto accompanied the rough estimation of "sowing area." Each contains 12 plots of half or one acre each. These trials demand a considerable amount of time and care from the Instructors.

CULTIVATORS' IMPROVEMENT SOCIETIES.

Apart from the ordinary work of the Instructors' circuits, an effort was made in 1923 to organize small village societies for discussion of agricultural matters. Credit is due to Instructor Crispeyn for his energy and care in this matter. Three societies were started in Kegalla District, and paddy trials, irrigation matters, competitions, bee-keeping, co-operative societies, and many minor questions were discussed. The whole organization of these meetings falls on the shoulders of the divisional staff and it is not possible to handle many societies: useful results have followed the efforts up to date, notably in the matter of repairs to village irrigation works.

SCHOOL AND HOME GARDENS.

There were 156 registered school gardens in the division, and during 1923 there were 18 new applications for registration which have not yet been granted. The practical work done in these gardens is, on the whole, good, but it is doubtful whether the teaching of nature study as a subject in the school classes is up to standard.

The home gardens system has practically ceased to exist in the Central Division. In 1923 an Agricultural Instructor was seconded to visit all schools and to report on the possibility of reviving the system.

Rs. 600 was disbursed as awards to teachers for school gardens work, and Rs. 200 to pupils as prizes for work in home gardens.

It is not possible for one Inspector efficiently to visit, advise, and judge the 156 school gardens of the division, nor does it appear sound to remove this work entirely from the sphere of the Instructors. Much greater latitude was therefore granted to Instructors in this matter in 1923.

CO-OPERATIVE CREDIT SOCIETIES.

The annual audit of these societies was carried out in April and May by the Divisional Officer, acting as Assistant Registrar, and Inspector S. B. Yatawara. Six new societies were founded, bringing the total up to 37 for the division. Membership worked out at $2\frac{1}{2}$ persons per 1,000 of population, so that the movement has obviously not yet been fully popularized. Steps were taken to wind up the affairs of four societies, whose finances appeared hopeless.

An enormous amount of attention, out of proportion to the present size and capital of these societies and only defensible because of their potential importance, has been given to the co-operative movement by the staff during 1923.

G. AUCHINLECK,
Divisional Agricultural Officer, Central Division.

REPORT OF THE PERADENIYA FARM SCHOOL FOR 1923.

The number of students in the school at the commencement of the year was as follows:—

Second-year English class	..	..	..	14
First-year English class	..	..	..	15
			Total	29
Vernacular teachers' class	..	..	..	12

Hostel.

The health of the students at the commencement of the year was bad. During February and March an epidemic of influenza, which was prevalent throughout the Island, broke out, and practically all students were affected. Two students were removed from the hostel in March: one to Kandy hospital, suspected of enteric; the other went home to Panadure and developed enteric fever.

On March 3, all students, staff, hostel servants, and labourers were vaccinated against smallpox, which had broken out near Peradeniya.

Examinations.

The final examination of the second-year students was held in March, the results of which are as follows:—

				Classes.
L. J. P. Perera	..	..	..	1st Class
M. P. D. Pinto	..	..	..	Do.
C. E. de Saram	..	..	..	2nd Class
J. H. L. de S. Jayasundera	..	..	..	Do.
V. L. de S. Senaratne	..	..	..	Do.
Passes.				Passes.
J. S. Fernando				M. S. Perera
R. D. Kadramer				J. L. Caspersz
E. F. Kannangara				F. A. Fernando
B. E. J. Payoe				H. L. Hastings
C. O. Peiris				

Awards.

"The Rajapakse Gold Medal," for the best all-round student of the course, awarded to L. J. P. Perera.

His Excellency the Governor's Prize, for general efficiency in Practical Agriculture, awarded to J. S. Fernando.

For Agriculture:—

M. P. D. Pinto	..	..	..	1st Prize
C. O. Peiris	..	..	..	2nd Prize

For Agricultural Chemistry:—

L. J. P. Perera	..	..	..	1st Prize
V. L. de Silva	..	..	..	2nd Prize

For Agricultural Botany:—

L. J. P. Perera and M. P. D. Pinto	..	..	1st Prize
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For Economic Products:—

M. P. D. Pinto	..	..	1st Prize
C. E. de Saram	..	..	2nd Prize

For Agricultural Zoology:—

L. J. P. Perera	..	..	1st Prize
J. H. L. de S. Jayasundera	..	..	2nd Prize

The school is indebted for awards of medals and prizes to the following gentlemen :—Gate Mudaliyar A. E. Rajapakse, J.P. ; Sir Solomon Dias Bandaranaike, Kt. ; Muhandiram N. Wickremaratne ; Sir H. M. Fernando, Kt. ; Mr. J. C. Ratwatte, Dissawa ; Mudaliyar V. M. Muttukumaru ; Hon. Mr. H. L. de Mel, C.B.E. ; Mr. W. A. de Silva, J.P., Mr. Graham Pandithasekera ; Mr. E. A. Elapata, Dissawa.

Two students who were ill at the time of the examination were permitted to sit for their papers in May, and both secured certificates.

The teacher-students who had entered in May, 1922, also took their final examination in March, 1923, with the following results :—

G. D. Peiris	..	..	..	Silver Medal
D. S. Wickremasinghe	..	..	..	Do.
M. P. Banda	..	..	..	Bronze Medal
M. P. Banda	..	..	..	Certificate
M. U. Banda	..	..	..	Do.
R. W. U. Banda	..	..	..	Do.
U. Banda	..	..	..	Do.
U. K. D. Cornelis	..	..	..	Do.
H. Ebith Appu	..	..	..	Do.
P. M. James	..	..	..	Do.
K. P. James Singho	..	..	..	Do.
K. D. A. Nanayakkara	..	..	..	Do.
M. B. Nissanka	..	..	..	Do.
G. D. Peiris	..	..	..	Do.
D. S. Wickremasinghe	..	..	..	Do.

One teacher who was unable to gain a satisfactory percentage of attendance was required to spend a further period of three months till the end of the first term.

The results of the examination, on the whole, were satisfactory.

One of the second-year students belonged to 1920–22 class, and as he failed to obtain a certificate on the results of the 1922 examination he was permitted to rejoin the school for a year, prior to taking the final examination again.

Prize-giving.

The annual prize-giving of the school was held on August 25. The Colonial Secretary, Mr. Clementi, presided, and Mrs. Clementi distributed the awards and certificates.

On August 24 the annual sports of the school were held by the students at the Royal Botanic Gardens.

New Classes.

In May, 1923, two new classes were formed : for the English course 16 students were accepted, and 12 teachers were sent by the Department of Education for instruction in the vernacular.

Staff.

Three special lectures were delivered at the school by the Director on Agricultural Education and Training, by Mr. Petch on Botanical Investigation in Ceylon, and by Mr. Joachim on Soil Surveys. The Divisional Agricultural Officer gave a short series of six lectures in the class room on subjects pertaining to work. Weekly demonstration-lectures in plant diseases, crop pests, and plant improvement were given to the second-year class by Messrs. Bertus, Austin, and Wickramasekera respectively.

The estate accounts continue to be taken by Mr. Claude Pereira ; and co-operative lectures are given by the Secretary, Board of Co-operative Credit Societies.

The staff comprised Mr. J. C. Driberg, Farm School Officer, Messrs. G. V. Wickremasekera, E. S. de S. Jayasundera, and Mr. C. Wickramaratne in charge of the vernacular work.

In July Mr. Wickremasekera was appointed Assistant to the Economic Botanist, and Mr. R. S. D. Jansz, who had passed through the school in 1919–21 and subsequently was on the tutorial staff of St. John's College, was appointed.

Tours.

The annual tour of the school took place in March, when 2 members of the staff and 25 students visited Jaffna and Anuradhapura. At Jaffna, the students attended the Agricultural Conference which was held by the Department.

The teachers' class visited the following schools with the object of making a critical study of school gardening and agricultural instruction at these centres :—Beddewela ; Mirigama ; Nugawela ; Idamegama ; Gunnepana ; and the visits were found to be profitable. Periodic visits were paid, as is done each year, to the Ampitiya Seminary Farm, the New Peradeniya Tea Factory, the Chocolate Factory, &c.

FIELDWORK.

The practical work of the students was satisfactory, that of the teachers being particularly good.

The tapping and preparation of rubber was systematically carried out by students.

The maha crop of 1922, which was raised entirely by the students, was harvested in February. One block of the field was set apart for investigation work, and students calculated the experimental error of field trials, the results of which are embodied in a paper appearing in the " Tropical Agriculturist " for May, 1923. This will be continued for some years. An attempt is also being made at the school to obtain strains of local yellow maize which will breed true to type.

Practical classe in horticulture and planting are conducted by the staff of the Royal Botanic Gardens and the Experiment Station, Peradeniya, respectively, where students attend each week.

A special feature of work undertaken by students was the study of the agricultural economics of the village of Gannoruwa. This was commenced at the end of the year, and will be continued by the second-year class till they leave in March next. This gives promise of proving both instructive and interesting.

Live Stock.

A start with poultry rearing has been made. A pen of pure bred White Leghorns was obtained in August, and the birds are doing well. A proportion of the students show great interest in the work. The sale of eggs and chicks will be undertaken shortly. The runs were erected by the students; and special houses and runs for chickens made.

The practical work of the school will be greatly enhanced next year with the importation of cattle and the development of poultry-keeping.

Plans for the construction of the cattle shed are in the hands of the Public Works Department.

Bee-keeping.

The school showed a bee exhibit at both the Gampaha Pageant in July and the Kandy Agricultural Show in August. At Gampaha, the Farm School Officer delivered a lantern lecture on bee-keeping, which was rendered into Sinhalese the next day by Mr. C. Wickremaratne with the assistance of the Bee-keeping Instructor, who gave a demonstration on the handling of bees.

Peradeniya, April 29, 1924.

J. C. DRIEBERG,
Farm School Officer, School of Tropical Agriculture.

SOUTHERN DIVISION.

THE COTTON EXPERIMENTAL STATION AT AMBALANTOTA.

THE yields of the various varieties of cotton grown on the Cotton Experimental Station at Ambalantota for the season 1922-23 were as follows :—

				Acreage.		Cwt. qr.	lb.
Durango pure	..	..	..	4	..	35	3 23
Durango mixture	..	..	..	1	..	7	3 0
Cambodia Strain 15	..	..	..	21	..	92	1 4
Cambodia local	..	..	..	20	..	67	2 18
South African	..	..	..	1	..	8	3 5
Sakellarides	..	..	..	1	..	4	3 27
Sea Island	..	..	..	5	..	23	1 5
Karranganni	..	..	..	1	..	0	1 25
Dirty cotton of all varieties	..	..	..	—	..	8	0 6
			Total	..	54	249	1 9
							Rs. . c.
The value of cotton and seed was	..	..	..	..	..	7,502	93
Superintendence expenses	..	..	..	..	..	5,727	39
Profit	..	..	..	..	..	1,775	54

Full details of the cost of cultivation and yield of the various plots have been worked out in detail and can be obtained on application to Headquarters. The comparative yields for the two seasons are as follows :—

			Yield of Seed Cotton per Acre.		
			1921-22.		1922-23.
Durango	..	..	690	..	1,037
Cambodia	..	..	622	..	379
Cambodia Strain 15	..	..	—	..	492
American Upland from South African seed		..	—	..	985
Sea Island	..	..	593	..	522
Sakellarides (Egyptian)	..	..	312	..	559
Karanganni	..	..	462	..	53*

* The germination of this variety was poor.

It will be observed that Durango again headed the list with a yield of 1,037 lb. per acre, an increase of over 347 lb. on the previous year. The new variety, viz., South African was a good second with a yield of 985 lb. per acre. Cambodia fell off considerably and gave only 379 lb. per acre. The comparative costs are also included in the lists, and it will be easily seen that Durango and the South African varieties have given the most profitable results.

For the season 1923-24 the following experiments have been laid down :—

	Acres.		Acres.
Durango selected	.. 5	Zululand Hybrid	.. 1
Durango ordinary	.. 10	Sea Island ..	.. 1
Durango American	.. 10	Cambodia local	.. 1
South African	.. 5	Creeping lima beans	.. 1
Watts long staple	.. 5	Ground nuts ..	.. 1
Cambodia Strain 15	.. 10	Maize	.. 2

Also two acres of tobacco seedlings were planted out.

The feature of this year's experiments will be the growing of the rotation crops, in order to fight against the cotton pests, and at the same time to pay for costs of cultivation as well. The rotation crops are tobacco, groundnuts, maize, and lima beans. The tobacco nursery was laid down in September and the following four varieties planted:—Indian White Burley, Blue River Burley, Ceylon White Burley, and Adcock. All the tobacco varieties germinated well, and the seedlings were planted out with the first north-east rains in October. The crop will be grown without irrigation. Up to the present all the varieties of cotton seed and rotation crops have germinated satisfactorily, but the continual rains have made it impossible to weed with the mamoty, and only hand weeding along the drills has been resorted to. The cotton caterpillar pest, *Cosmophila erosa*, which attacked the plants in the seedling stage so badly last year, has done very little damage this year. This I think may be attributed to the continuous rains. Labour is very scarce this year owing to the irrigation works on the left bank of the Walawe-ganga at Ridiyagama.

PEASANT COTTON GROWING SCHEME.

As a result of the above cotton experiments there has been a steady growing demand for cotton seed by the small holders in that district, and in 1923 the following scheme was mooted to encourage further cotton growing by the peasants in one-acre plots. The scheme was that every cultivator applying for two acres of chena land (this being the usual acreage given out to cultivators for chena cultivation in that district) would also be given the option of taking a lease of three acres in all, on condition that one acre was planted with cotton, the extra one acre leased at Re. 1. Government fully approved of the suggestions made, and on March 29 a meeting of the Food Production Committee, Hambantota, was convened in order to discuss further details of the scheme. Questions that had to be settled were—

1. Variety of cotton to be grown.
2. Appointment of an Agricultural Officer to supervise and instruct all cultivators.
3. Amount of seed wanted, supply and payment for same.
4. Fixing of main and minor collecting centres.
5. Obtaining a guaranteed price for 1925 crop.

As a result of the meeting referred to, propaganda work was started and leaflets issued showing results that had been achieved at the Experimental Station. Also the Chief Headmen were very enthusiastic, as they knew the results that could be obtained by growing small plots. By the end of May the following number of applications for land had been received, and the rent for same deposited:—

	Acres.		Acres.
Paragam palata	.. 426	Phalawadakada palata	.. 179
Welgam palata	.. 231	Moderagam palata	.. 101
Dhalawadakada palata	.. 294		

Making a total of 1,231 acres in East Giruwa pattu alone. There were also 217 applications from Magam pattu and 102 applications from West Giruwa pattu, a grand total of 1,649 acres.

I attribute the large number of applicants from East Giruwa pattu to Mudaliyar Wijetunge, who has worked very enthusiastically to popularize this new industry.

The supply of seed caused anxiety, as it was desirable to supply the cultivators with a long staple variety to enable them to fetch as high a price as possible on the market. Durango was recommended, but this was unobtainable. However the Director of Agriculture was fortunate in obtaining an adequate supply of a long staple variety from South Africa, and the consignment arrived at Hambantota on September 29, in time for planting with the break of the north-east monsoon. The seed was all packetted in 6- and 7 lb.-packets and delivered to various distributing centres and to the cultivators by means of double carts in co-operation with the headmen.

It was found that the small holder was unable to pay for the seed at the time of delivery, and payment for the seed has been deferred until harvest.

Unfortunately this year the continuous rains have interfered with the burning of the chenas, and this will militate against such a successful year as was at first anticipated. However, where it has been found impossible to burn, permission has been given to the small holder to cultivate last year's chenas, and in spite of the rains a considerable acreage will be planted up. I have recently seen plots with the seedlings first coming through and planted in a systematic manner. Some of the cultivators have already realized some of the troubles experienced at the Experimental Station, especially damage to seed from jungle rats.

Last year the cotton grown by small holders was bought by the Agricultural Department direct and afterwards sold to the Weaving and Spinning Mills, Colombo, for a guaranteed price. This year owing to a much larger area being planted other arrangements will be necessary, and further details of buying the crop will be worked out after an estimate has been made later on of the yield to be expected.

KEKUNADURA COTTON PLOT.

The experiment on two acres of old chena land at Kekanadura in the Matara District was continued during the year. The plants are looking fairly well in spite of the rains.

MINOR EXPERIMENTAL STATIONS.

Results obtained from comparison of the yields of local varieties of foodstuffs have been reported from time to time. The roselle (*Hibiscus Sabdariffa*) fibre plants grown at Batapola were cut and made into hemp and were reported on by the local fishermen very favourably. A small definite acreage has been planted this year, in order to find out the yield per acre, costs of preparing the hemp, and value of same. Also these stations are very useful for growing sufficient Daincha seed for small field manurial trials. At Ambalantota, the sisal plants are now growing well, but I fear that the costs incurred will make it not a remunerative crop.

The rubber trees at Bandaragama are now ready for tapping, and will be leased out during the year.

PADDY MANURIAL EXPERIMENTS. 1923.

Twenty-eight paddy manurial experiments were conducted in this division during maha, 1922-23, and yala, 1923. Of these, 12 were in the Kalutara District at Horawala, Welipenna, Lewanduwa, Owitiyala, Kalupahana (2), Mirishenyaya (2), Pinnagoda, Edurgala, and Ittapana (2); 5 in the Galle District at Pitiwela, Batapola, Magala, Kalehe, and Halpatota; 11 in the Matara District at Telijjawila, Parawehera, Kirinda, Kamburupitiya, Hakmana, Kekanadura, Aturaliya, and Halalla.

The manures tried were chiefly artificial, and in some instances in conjunction with green leaf whenever it was obtainable in sufficient quantities. The chief obstacle to a more general use of green leaf was the difficulty of collecting it in large quantities without heavy cost, and this the owners of plots were not prepared to bear. Those owners who understood the value of green leaf as a manure bore this extra cost quite willingly, though in one or two instances its application did not give markedly increased yields, and this was chiefly due to the quantities applied being insufficient. From results achieved in this division it may be safely concluded that an application of 1,500-2,000 lb. of green leaf to the acre is necessary to make an appreciable increase in yield.

The artificials chiefly used were: fish manure, animal meal, ephos phosphate, bone meal, basic slag, Tonkin mineral phosphate, calcium cyanamide, nitrate of soda, groundnut cake, and castor cake. The usual quantity applied was 150 lb. to the acre.

Fish Manure.—This manure did well wherever it was tried but especially in the Matara District, and in one instance when applied along with green leaf gave an increase of nearly 20 bushels to the acre at Hakmana in Kandaboda pattu.

Animal Meal.—This manure gave good results in Pasdun korale west, but the increase obtained over the average was not sufficient to cover its high cost, and the application of this manure cannot be recommended till further experiments are carried out in this area. In the Galle district, yields slightly above the average were obtained, but in the Matara District it proved a failure.

Ephos Phosphate.—In almost every trial where this manure was applied, yields far above the average were obtained, and it can safely be recommended for general use, especially just now owing to its low cost. At Halalla in Weligam korale 150 lb. of this manure applied with about 1,000 lb. green leaf to the acre gave a yield of 25 bushels over the average.

Bone Meal.—The most popular artificial manure with the "goiya," kept up its reputation and in many cases did much better than fish, animal meal, or ephos phosphate; and with green leaf gave an increase over the average of 20 bushels to the acre at Hakmana in Kandaboda pattu. Owing to the present high cost of bone meal, this manure can safely be replaced by ephos phosphate, which is about Rs. 50 less per ton.

Basic Slag.—This manure was used chiefly in boggy lands in Pasdun korale west and Gangaboda pattu (Galle District), and has been found to do very well. At Lewanduwa and Ittapana in Pasdun korale west very substantial increases were obtained, and at Ittapana the yield was almost double the average. Further experiments are being conducted with basic slag in this area.

Tonkin Mineral Phosphate.—This manure was tried for the first time in this division in maha, 1922-23, at Telijjawila in Weligam korale. An application of 200 lb. to the acre gave an increase of 20 bushels over the control, and being a low-priced manure its application ought to pay, if it does so very well as it did in Weligam korale. Further experiments with this manure are being conducted.

Nitrate of Soda.—This was tried only at Kekanadura in the Matara District. A very slight increase over the average was obtained, but its application would not pay owing to the high cost of this manure.

Groundnut cake, castor cake, and calcium cyanamide have also been tried, but have not produced increased crops. Further trials with these three manures on paddy are not recommended.

Daincha plots were also established at Kobowella and Horawella. The crops have been muddled in for the yala season and results will be reported after harvest.

The continued manurial trials are being more carefully watched and inquired into than previously, and the farmers' great objection to the use of all other artificial manures excepting bone meal is gradually dying out. It is of interest to note that in Weligama and Morawak korale the farmers are now conducting their own small transplanting of paddy experiments and manuring of same at their own expense.

PADDY EXPERIMENTS.

Several paddy experiments have been tried with pure line paddy seed. It was found that the age of maturing varied according to the temperature and climate from that of the seed station. Experiments in future will be made from seed previously collected from definite centres, in order, as far as possible, to eliminate this.

SALT WATER EXPERIMENTAL STATION.

A trial with salt water resisting paddy imported from Hong Kong is being tried at Ittapana during the next yala season.

AGRICULTURAL SHOWS AND COMPETITIONS, 1923.

Shows.—One show was held during the year at Tissamaharama and was confined to Magam pattu only. This show was a great improvement on the one held the previous year, and every class of exhibit was very well represented.

Arrangements were made to hold a show for West Giruwa pattu at Tangalla, but had to be abandoned later owing to unfavourable weather conditions.

Competitions.—*Paddy:* In Pasdun korale east of the Kalutara District a prize of Rs. 25 for the best transplanted paddy plot was offered to each of the six following divisions, viz., Agalawatta palata, Bellana palata, Magura palata, Meegabatenna palata, Welgam palata, and Warakagoda palata. Agalawatta and Welgam palatas fell out of the competition owing to want of entries. In the other four divisions, though the number of entries were few, the plots exhibited had been systematically and carefully cultivated.

A competition for weeded paddy plots in the Bentota-Walallawiti korale drew a fairly large number of entries and the competition was close and keen showing the great interest taken by the entrants.

In the Matara District two paddy transplanted competitions were held during the yala (1923) in Gangaboda pattu and Weligam korale. Transplanting of paddy is gradually gaining a hold in Gangaboda pattu as was evident from the keenness displayed by the competitors. In Weligam korale a few exceptionally good plots were exhibited, but this was mostly by large landowners and it was evident that the small holder has not yet taken to transplanting.

Vegetable Garden Competitions.—Eight very successful garden competitions were held in different districts of the division during the year under review.

Kalutara District.—Four competitions were held in Pasdun korale east, and it is very gratifying to note that the villagers are realizing the value of these competitions from the number of entries, which in these competitions are gradually increasing.

Galle District.—In the Wellaboda pattu there being no entries, the competition had to be abandoned.

In Talpe pattu quite a large number entered the competition and most of the gardens exhibited were of a very high standard.

In Hinidum pattu only two gardens entered, and hence only one prize was awarded. The great drawback in this pattu is the want of a market to dispose of the produce. Thus the cultivator grows just enough for his consumption, as any surplus cannot be disposed of.

Matara District.—Two very successful garden competitions were held in the Four Gravets and Kandaboda pattu, but the competition arranged for Morawak korale had to be abandoned for want of entries.

The gardens exhibited, especially those of Kandaboda pattu, had been carefully and systematically cultivated, and it is pleasing to note that these competitions are gradually stimulating a greater production of vegetables and other food products, *e.g.*, yams, &c., in village gardens.

A Police garden competition worked in the Galle District during the year. Competition was keen and the result has been a great improvement in the surroundings of the Police Stations.

PESTS.

There was a serious outbreak of the rhinoceros beetle pest of coconuts in the Wellaboda pattu, Matara District, during the year. All the estates were inspected, and those infected were served with the usual notice to clean up and burn all refuse lying on their estates. This was done with the exception of three cases and these were dealt with under the Plant Pest Ordinance. One defaulter was fined Rs. 10 and the other two cases are coming up for further trial.

Paddy fly (*Leptocoris varicornis*) and paddy cutworm (*Spodoptera mauritia*) have been reported at various centres doing considerable damage. The usual steps for combating these pests have been taken, and it is of special interest to report that the cultivators have carried out such instruction as given by the Agricultural Instructors. Also special attention has been paid to the eradication of the kudametta weed.

SCHOOL GARDENS.

In this division there are 138 registered school gardens. Sixteen of these are registered for grant. There are 47 school gardens awaiting registration, as follows:—Kalutara District 12, Galle 11, Matara 15, Hambantota 9.

The majority of the school gardens attached to the Government elementary schools, excepting a few where conditions are difficult for gardening, have been well laid out and planted with ornamental plants, fruits, different kinds of vegetables, and other food crops. Beans, roselle, and onions are some of the new crops which are being cultivated in these gardens.

The total number of home gardens attached to the gardens of pupils of elementary schools in the division amount to about 5,000.

Awards.—Awards amounting to Rs. 700 and certificates were granted to 56 Government school teachers who did good work in their gardens during the year. Another 16 certificates were also issued without monetary awards. Monetary awards amounting to Rs. 200 and certificates were issued to 58 pupils who did satisfactory work in their home gardens.

Beehives.—There are total of 38 hives in the schools of the Kalutara, Matara, and Hambantota Districts. These are being maintained in good condition. There are also many who have taken up bee-keeping and are beginning to make hives similar to those supplied by the Department.

Madras Thorn Hedges.—Madras thorn seeds were distributed to all school gardens in the Kalutara, Galle and Matara Districts. Only a few schools in the Hambantota District received seed. Two circulars were issued giving instructions regarding the growing of Madras thorn hedges. A report is now called for from all teachers who received seeds about progress made. Duranta hedges are also being grown in a few school gardens. Duranta is proving to be a more successful hedge plant for this division.

Kalutara District School Garden Competition.—The annual prize of Rs. 100 given by Muhandiram W. D. Fernando Waidyasekera is encouraging the teachers to do better work in their gardens. Nineteen school gardens are competing for it this year.

Implements.—The undermentioned implements to the value of Rs. 2,400 were distributed to the school gardens during the year:—alavangoes, buckets, mamoties, watering cans, digging forks, weeding forks, rakes, garden shears, sheep shears, pruning knives, cattles, and bill hooks.

FOOD PRODUCTION COMMITTEE MEETINGS.

Meetings of the above committees have been held from time to time at Galle, Kalutara, Matara, and Hambantota. The committee at Matara has been reconstituted, and will be known as the Matara District Agricultural Committee in future. The proceedings of these various committees have been reported from time to time.

F. BURNETT,
Divisional Agricultural Officer, Southern Division.

NORTHERN DIVISION.

LECTURES AND DEMONSTRATIONS.

In the Jaffna peninsula, lectures to village cultivators were given by the Farm Manager, Experiment Station, Jaffna, and by the Agricultural Instructor on the cultivation of White Burley tobacco, and by the Agricultural Instructors, Mannar and Trincomalee, on paddy green manuring and pest control, and also on vegetable cultivation.

A considerable quantity of vegetable seed distribution was done both in Mannar and Trincomalee Districts.

PADDY MANURIAL TRIALS.

Similar manurial trials to those conducted last year were carried out in the Jaffna, Mannar, and Trincomalee Districts, and the results emphasized the value of green manuring.

SALT RESISTING PADDY TRIALS.

Nine bushels of "Mo Kuk" paddy obtained from China were distributed in the Jaffna, Mannar, and Trincomalee Districts for trial.

Some fair results are expected.

COMPETITIONS.

In Mannar District.—A paddy green manuring competition was held in Nanaddan East and West, 25 cultivators competing, and a vegetable garden competition was also held in Mantai North and South.

In Trincomalee District.—A paddy cultivation competition was held in Kaddukulam East, and a garden competition which was confined to the Trincomalee town and gravets.

FOOD PRODUCTION COMMITTEE.

Meetings of the above have been regularly held at Jaffna, Mullaittivu, Mannar, Anuradhapura, and Trincomalee.

SCHOOL GARDENS.

There were 54 registered school gardens at the end of the year.

Twenty-five prizes were awarded during the year and 25 certificates.

TOBACCO.

There has been a considerable extension in the cultivation of White Burley tobacco.

DRY ZONE EXPERIMENT STATION, ANURADHAPURA.

Fibre.

Sisal Hemp.—The earliest planted plots having reached maturity, a decorticating machine obtained from Mauritius was erected, and fibre satisfactorily extracted during the dry season. The figures obtained have been fairly good. The plants have yielded on the average 60 leaves for the two cuttings, each leaf weighing about $1\frac{1}{2}$ lb. The weight of fibre per acre has been $1\frac{1}{2}$ tons—the percentage of fibre to green leaf varied from 2.75 and 3.5.

The crop is showing a tendency towards early poling. During the long drought of five months experienced this year, the lower leaves of many plants drooped considerably, but with the advent of the rains they quickly regained an erect habit of growth.

Mauritius Hemp.—The crop has made luxuriant growth, but the leaves yielded a poor percentage of fibre.

Roselle.—*Hibiscus sabdariffa* var. *Altissima* made good growth, reaching an average height of 7 feet, and produced a calculated yield of fibre of 1,200 lb.; whereas the local variety produced 1,000 lb. of fibre.

Cotton.

Varietal tests were begun in October with Cambodia, South African, and Durango cottons.

Kapok.

This area which failed last year owing to excessive rains has been replanted during the north-east monsoon with 6-month old nursery plants—the plants are thriving.

Sunn Hemp.

Sunn hemp has been grown as a green manure crop and for the extraction of fibre.

African Oil Palm.

Crop increase has been fairly satisfactory. A pruning trial has been begun to test the merits of heavy *versus* light pruning.

The black rhinoceros beetle has been rather troublesome.

Coconuts.

The block on irrigable land continues to thrive; 20 per cent. of the trees have come into bearing.

During the north-east monsoon cattle tying has been resorted to, and during the south west the land after ploughing has been kept clean and loose with the disc harrow.

Limes.

The many vacancies have been supplied and are thriving; the older trees are bearing heavy crops. Continuous fruiting is a feature of the British Guiana limes, and the large round fruits contain a higher percentage of citric acid than the local variety.

Fruit Section.

Good crops of oranges, lemons, pineapples, plantains, guavas, sour sops and mulberries have been obtained.

Sugar Cane.

The old plots are being eradicated and fresh ones started.

Paddy.

With the arrival of the north-east monsoon, a start was made with the work of converting a 60-acre block of cleared jungle land situated on the western side of the railway into paddy fields by means of prison labour.

Demonstration Plots.

Tests with varieties of millets, legumes, tubers, vegetables, cucurbits, oil crops, and curry stuffs were made.

New Works.

A cooly line of four rooms, an implement shed, and an assistant foreman's quarters (all temporary buildings) have been erected.

Labour.

The health of the labour force has been satisfactory.

There has been a reduced outturn of prison labour during the greater part of the year until November, when the number rose to 70.

Rainfall.

73·4 inches of rain fell during the year.

EXPERIMENT STATION, JAFFNA.

Buildings and New Works.—The Farm School Officer's bungalow, the school block, the engine shed and the milk room have been completed, and a temporary shed for the Farm Manager's Office has also been erected.

The new well has been fitted with a 16-horse power Ruston Hornsby oil engine and a 4 in. centrifugal pump, but has not yet been supplied with the necessary shafting and belting.

The construction of occupation roads continues steadily. About 420 cart loads of gravel were spread over the two central and side roads.

The process of bringing new areas under irrigation by lowering and levelling the land was continued whenever possible.

Implements.—Two light ploughs were introduced during the year: a Meston plough and a Kon Kon plough, which turn furrows 5 in. or 6 in. deep and are capable of working in fairly moist soils. These ploughs are useful for paddy lands, but for garden lands Ransome's Monsoon plough is the best of the various types in use at the station. A chaff cutter has been introduced and is now doing useful work. A start has been made during the year to hire out ploughs and other farm implements to cultivators.

Three zinc-lined seed bins made by the Prison Department, Kandy, have been installed.

Live Stock.—Six bullocks are maintained on the farm, of which 2 were bought during the year.

Season.—The total rainfall for the year was 62·19 inches, 21·42 inches heavier than last year. Its distribution was however faulty. More than half the fall was received in the north-east monsoon period, and most of it fell in heavy showers which did more harm than good.

Tobacco.—The main crop of this station had a set back at the earlier stages owing to the failure of the nurseries, due to the heavy rains of December and January, which caused the damping off disease in the nurseries.

The 1922 White Burley crop consigned to the Crown Agents, London, for sale, fetched 1s. 6d. per pound. The 1923 crop amounting to 2,500 plants yielded 353 lbs. of cured tobacco. The cultivation of White Burley in the district is increasing, and during the year 6,201 plants of White Burley were bought from cultivators at various rates ranging from 5 to 20 cents, and 46½ oz. of seed were distributed for planting during the next season, 1924.

Of the 800 plants of Mauritius tobacco, 200 were air cured, while the remaining plants were cured in the native style for cigars. The former was sent to London for sale, while the latter was sold locally for Rs. 90, i.e., at 15 cents per plant.

3,000 seedlings of the local cigar variety were planted in the manurial experimental plots, to compare for the first time the various methods of manuring employed by the cultivators with the method adopted on the station for White Burley—sunn hemp as green manure and green leaf and artificials. The residual effects on the subsequent crops, kurakkan, were also noted.

Fodder Crops: Cholam.—The results of the trials for the past three years have shown that cholam is a particularly good fodder crop for local requirements. Several cultivators have obtained seed from this station and all speak highly of the crop.

Periyamanjal Cholam.—The best of the several introduced varieties gave a yield of 840 lb. of grain and 6,820 lb. of straw per acre.

Dwarf Milo.—An American variety yielded 552 lb. of grain and 4,546 lb. of straw per acre.

Guinea Grass.—Which is keeping up its reputation as a fodder crop was cut four times during the year. It yielded 35,000 lb. per acre. Introductions such as Lucerne, Napier's grass, and Cluster beans have thrived remarkably well. The following crops grown, though they do not directly fall under the category of fodders, namely, dhall, groundnuts, and cowpea, yet have served to relieve a temporary scarcity of green food.

Kurakkan.—Varietal tests with eight from Mysore, one from Madras, and two from the Jaffna district were continued. The best yielders were local W (Makki Vellai), Bellary Ragi, and H 13 Green open.

Selections.—Fifty-nine single plant selections were planted this year in small plots. The purple glumed types, of which there were 24 lots matured earlier than the rest, which had green glumes and gave better yields.

Cultivation Experiment.—In this experiment bed *versus* ridge planting, the results showed that ridge planting will give equally good results with a considerable saving in irrigation.

A bulk crop of Makki Vellai (Local W) planted in field No. 7 to test the residual effect of the various manures applied to the previous crop, tobacco, yielded 1,088 lb. of grain and 3,500 lb. of straw per acre.

Tenai or Italian Millet (*Setaria italica*): *Manuring*.—The manurial experiment to test the effect of nitrate of soda and fish manure on this crop was continued. The results were in favour of the fish guano plot.

Selections.—Twenty-seven single plant lots were put out for seed multiplication.

Cultivation Experiment.—Broad casting *versus* transplanting. The former yielded 672 measures per acre and the latter 864 measures.

Chillies: Selections.—Twenty-seven single plant selections were planted.

Cambodia Cotton.—Heavy rains in February adversely affected this crop. The yield was 206 lb. per acre.

Maize.—Hickory King yielded 448 measures and Small Dent yielded 340 measures per acre.

Onions.—A comparison was made between planting in ridges and in beds. The former method again produced the larger yield.

Yams.—A comparative trial was started sections *versus* whole yams planting.

Manioc.—A comparative test made between planting cuttings flat, and erect resulted in favour of flat planting.

Cucurbits.—Six new varieties of pumpkins were tried during the year with satisfactory results. Successful crops of gourds, melons and cucumber were grown.

Cambu.—Nagpur Cambu which was introduced in the previous year grew well and yielded 352 measures per acre.

Tomatoes which occupied one-fourth acre yielded 997½ lb. of fruits, and a sum of Rs. 98.58 was realized by sale.

Groundnuts.—Early *versus* late sowing in November resulted in the early sown crops yielding 1,200 lb. per acre while the late sown crops yielding only 800 lb. per acre.

Plantains.—Thirteen varieties of plantains were cultivated. The total revenue from this crop, which occupied about half-an-acre, was Rs. 106.76.

Coriander.—The germination of this crop was uneven. Its yield was 320 lb. per acre.

Dhall.—The crop appears to be of some value as a fodder crop for unirrigable lands if regularly pruned and the green material used as fodder.

Linseed.—A small plot made good growth and yielded 1 lb. of seed.

Seed Distribution.—The following quantities of seed were distributed from this station during the year:—

Dried chillies	..	9 lb.	Yam varieties	..	313 lb.
Cambu seed	..	5½ measures	Coriander	..	9½ "
Dhall	..	6½ "	Groundnut	..	10½ "
Horse gram	..	12 "	Tomato seedlings	..	379
White Burley seed	..	46½ oz.	Guinea grass sets	..	4,300
Periyamanjal cholam	..	491½ lb.	Chilly seedlings	..	5,000
Feterita	..	159 "	White Burley tobacco seedlings	..	7,270
Chitrai cholam white	..	37 "	Native tobacco seedlings	..	1,100
Cambodia cotton	..	33½ "			

General.—An agricultural conference was held on the Experiment Station, Jaffna, during the second week of March. It served as a good medium for the supply of information. Demonstration of ploughs and other implements, lectures in Tamil on irrigation, fodders, and allied subjects were items in the programme.

A collection of cucurbits, fodders, sweet potatoe varieties and yam varieties, and other farm produce was exhibited at the Jaffna Agricultural and Industrial Show held in June, and gained a silver medal and a certificate.

EXPERIMENT STATION, KANNIYAI, TRINCOMALEE.

Development work was carried on throughout the year, this including—

The erection of a stout barbed wire boundary fence.

The provision of an efficient drainage system.

The construction of minor irrigation channels.

The erection of a set of temporary cooly lines.

The completion of this work will enable systematic trials with crops to be begun and useful results obtained during 1924. Plots of cotton, green manures, plantains, pineapples, vegetables, dry grains, and sugar cane have been established and a paddy manurial trial similar to the trials organized in the district is being carried out.

G. HARBORD,

Jaffna, January 25, 1924.

Divisional Agricultural Officer, Northern Division.

NORTH-WESTERN.

SCHOOL AND HOME GARDENS.

There are 84 registered school gardens, of which 64 are in the Kurunegala District and 20 in the Chilaw-Puttalam Districts. Eight school gardens were awaiting registration. Three were registered in 1923, and another 3 were recommended for registration in 1924.

Government awards have been granted to 26 school and 23 home gardens in the Kurunegala District and 9 school and 11 home gardens in the Chilaw-Puttalam Districts.

Colonel Wright's prizes for the best cultivation of vegetables have been awarded to the following gardens :—

First Prize : Ku/Kankaniyanmulla Boys' Vernacular School.

Second Prize : Ku/Hettipola Boys' Vernacular School.

First Prize : P/Walpaluwa Boys' Vernacular School.

The Agricultural Instructor, Chilaw, has been instrumental in getting the following prizes for competition in his district :—

- (a) A silver challenge cup, donated by the Hon. Mr. Schneider for the best school garden ; and
- (b) A prize of Rs. 25 for the best cotton and dhall cultivation in the Demala hatpattu.

Considerable improvement has been made both in the school and home gardens in the division. Systematic cultivation has been followed. Cultivation of dhall, onions, curry stuffs, and up-country vegetables has proved successful. Potatoes have been cultivated at Mahananneriya, Kankaniyanmulla, Walpaluwa, and Medamulla, and gram at Anamaduwa, Kankaniyanmulla, and Walpaluwa. Cotton has been grown in the following gradens :—

Ch/Maiyawa : Durango, Cambodia, and Sea Island.

Ch/Kelegama : Cambodia.

Ku/Medamulla : Cambodia.

Ku/Awlegama : Cambodia.

Ku/Nikawewa : Cambodia.

Teachers have been instructed to practise rotation of crops and keep correct crop registers and records. The following teachers have regularly submitted their records and have always utilized this material for their lessons on nature study :—

Punchi Appuhamy, Head Teacher, Ku/Weerapokuna.

A. H. B. Madawala, Head Teacher, Ch/Maiyawa.

B. R. Senanayake, Head Teacher, Ku/Nikaweratiya.

K. D. Banda, Head Teacher, Ku/Nakkawatta.

Paddy cultivation has been tried by some schools.

Special attention has been paid to the establishment of live fences in gardens of the Chilaw-Puttalam Districts.

Most of the school gardens were supplied with new implements. Beehives were supplied to a few.

CO-OPERATIVE PADDY TRIALS.

Two sets of manurial trials were being tried, viz. :—

- (1) To compare the relative value of green manures with or without phosphates ; and
- (2) To compare the relative value of green manure with or without other organic nitrogenous manures.

The first set of trials were conducted at Pussella, Narammala, Gokarella, Hettipola, and Medamulla, and the second set of trials at Awlegama, Nabirithawa, and Pussella.

Paddy transplanting and weeding trials were conducted at Pussella.

The absence of rain at the commencement of the maha season (1923–1924) delayed ploughing operations, and heavy rains during the early stages of growth washed away most seedlings. Many fields were resown a second time. The results obtained at Pussella last maha (1922–1923) have demonstrated to the village cultivator that high yields could be obtained by manuring, transplanting, and weeding. As a result of the korala's demonstration, over forty cultivators have manured, transplanted, and weeded an area of over 125 amunams of paddy land during the present maha season. Kalu Banda Korala's willing co-operation and good example deserve special recognition at the hands of his superiors. Two demonstrations on paddy cultivation were held at Pussella in February and December, 1923.

Another demonstration was held at Gokarella, when all the vel-vidanes of Dewamedhi hatpattu were taken and shown round the trial plots. In order to encourage better cultivation in their hatpattu, a special paddy growing competition has been organized in the Giratalana korale.

Pure line types of paddy received from Peradeniya have been sown in villagers' paddy fields at Bogomuwa, Pussella, Kuliypitiya, Pannala, Hettipola, Awlegama, Dematagahapelessa, and Narammala.

PADDY GROWING COMPETITIONS.

The following competitions have been organized for the year :—

- (1) Pitigal korale competition for the best acre of paddy grown in yala, 1923. The winner, Appuhamy of Gonawila, was awarded a sum of Rs. 80 to purchase a pair of buffaloes.
- (2) Mudaliyar Wijsekera of Kurunegala has offered a gold medal for the best acre of paddy grown in the North-Western Division during the maha season, 1923–1924.
- (3) Giratalana korale competition for the best acre of paddy grown in the korale.
- (4) Yagampattu competition for the best acre of paddy grown in Yagampattu in Chilaw.

PLOWING DEMONSTRATIONS.

Agricultural Instructors have demonstrated the use and benefits of a mould-board plough at Madampe, Uraliya, Nankadawara, Willatuwa, Andigama, Madurankuliya, Anamaduwa, Talgaswewa, Nattandiya, Awlegama, Hettipola, Ganewatta, Narammala, and Bandara Koswatta.

AGRICULTURAL SHOWS.

It was proposed to hold four village agricultural shows in 1923. On account of the severe drought during the first half of the year, three were postponed for the next year. A successful show was held at Chilaw and the prizes were donated by the residents of the town.

DEMONSTRATION GARDEN, DANDAGAMUWA.

This garden has been maintained in a good state under the supervision of the Agricultural Instructor. Cultivation of vegetables, food crops, the value of manuring, mulching, rotation of crops, and seed selection have been demonstrated. The garden has been enclosed by a barbed wire fence.

PLANT PESTS.

The coconut caterpillar pest has appeared on estates at Nattandiya, Iranawila, Ambakandawila in the Chilaw District, and near Polgahawela in the Kurunegala District. Frequent visits have been made to these affected areas and control measures have been taken to combat the pest.

Water hyacinth was found in a tank at Uraliya and destroyed.

FOOD PRODUCTION COMMITTEES.

Two meetings of the Food Production Committee were held at the Kurunegala Kachcheri. At the last meeting a resolution was passed that its designation be in future "District Agricultural Committee," and that its constitution and functions be altered accordingly.

G. E. JAYATILEKE HULUGALLE,
Divisional Agricultural Officer, North-Western Division.

February 1, 1924.

AGRICULTURAL INSTRUCTORS CONTROLLED FROM HEAD OFFICE PENDING
FURTHER DECENTRALIZATIONS.

Western Province.

The following extracts are taken from the report of Mr. D. H. J. Weerasuriya, Agricultural Instructor, Veyangoda :—

Besides giving instructions, the following were done towards the improvement of agriculture :—

Paddy Manurial Experiments.—A paddy manurial experiment is being carried out at Gampaha on a field whose area is 2 beras in sowing extent.

The following manures are being experimented with, viz., bone meal and animal meal.

Paddy Transplanting.—A very successful demonstration was given at Hapugahatenna estate.

Green Manuring and Liming of Paddy Fields.—An experiment with green manure and lime on a paddy field was conducted on a very small scale at Mottunna. Unfortunately the excess of rains during the season washed off the experiment and hence the results could not be seen.

Co-operative Societies.—At the meetings of the Mottunna Co-operative Society lectures were given on the advantages of Co-operative Societies in the villages, introduction of such societies into Ceylon and the like and increased the number of members in this society. Foundations have been laid for two or more societies in the district in two korales, viz., Hewagam korale and Salpiti korale.

Competitions.—In response to certain suggestions made by me to Mr. J. P. Obeysekera for the improvement of the paddy cultivation in his korale, viz., Siyane korale east, some paddy competitions have been arranged for the above korale.

Province of Sabaragamuwa.

The following extracts are from the report of Mr. A. Madanayake, Senior Agricultural Instructor, for the Ratnapura District :—

Cultivation Duties.—The Senior Agricultural Instructor and Instructors stationed at Balargoda and Godakawela attended to additional cultivation duties under major irrigation works at Batugedara, Kaltota, Kinchigune, Opanaika, Embilipitiya, Hingurawa, Tunkame, and a few other places.

Experimental Plots.—The experimental plots at Godakawela and Balangoda continue to serve the purpose for which they are intended, in distributing various crops that were grown there among village cultivators and school and home gardens. Citronella, which thrives well at Godakawela experimental plot, has been introduced to Embilipitiya, where it has been considered a new cultivation, pregnant with lucrative prospects for those who desire growing it on commercial lines. Gliricidia cuttings, Rhodes grass, and Coffea Robusta seed have been supplied to estates in Balangoda area.

A cotton experimental garden has been established at Embilipitiya for the first time, and proposals have been put forward to establish an experimental plot at Kuruwita to benefit the village cultivators of Kuruwiti korale.

Paddy and Vegetable Garden Competitions.—These, organized during the previous year, were started again this year and awards have been made by the Chairman of the Food Production Committee to the best plots from funds provided by the Department of Agriculture, to which Mr. Harry Ellawela added a prize of Rs. 10.

Mr. A. C. Attygalle, an Unofficial Member of the Food Production Committee, spared no pains in acting as a judge in inspecting various paddy and vegetable plots in Nawadun and Atakalan korales. He is also much interested in paddy experiments. Mr. Harry Ellawela is another member of the Committee who sets good examples to paddy cultivators of his area by interesting himself in modern methods of paddy cultivation.

Paddy Manurial Experiments.—The results of eight paddy manurial experiments carried out during last maha were so encouraging that the neighbouring cultivators who witnessed the growth of paddy in these experimental blocks wanted the very manures for yala cultivation, with the result that manuring of paddy on systematic lines is being adopted. Seven similar experiments were conducted during yala season and, although much damage was caused to crops by floods, the yield of paddy in these was far in excess of that of unmanured fields. Nine experiments are afoot during this maha, the results of which are not yet available.

Varietal Tests of Paddy.—Five varieties of paddies grown from selected grains by the Economic Botanist were introduced during last maha. These varietal trials were carried out alongside with paddies of same age; and as a consequence of good results achieved they were sown again during this maha with a view to further the introduction.

Cotton Cultivation.—Mr. George Brown's enterprise in cotton cultivation by opening up 10 acres in Mahawalatenna has had its desired effect. Villagers were encouraged to take up cultivation as a result of their being supplied with seed free of charge; but weather conditions were so unfavourable that intending cultivators gave up the idea of proceeding with the work, as they failed to get the jungle burnt after it had been felled. In addition to Mr. Brown's plot, which is cultivated for the second time, there are two more blocks of 7 and 3 acres in extent planted up at Mahawalatenna and Balangoda respectively by enthusiastic cultivators.

Co-operative Credit Societies.—Of these only Godakawela and Kahawatta Societies are doing active work.

School gardens.—The number of school gardens in Colombo and Ratnapura Districts has been increased, and special attention was given to the teaching of nature study lessons to pupils of those schools which own registered gardens. During the year under review, 68 school gardens in Colombo District and 60 in Ratnapura District have been inspected and instructions given.

Home Gardens.—Much attention is also paid to the establishment of home gardens. The teachers and pupils of school gardens have begun to realize the value of agricultural education. As a result of a few cash prizes awarded to children who got up home gardens during the previous year, there was some amount of keenness displayed by children in this direction. Thirty-six pupils in Colombo District and 42 in Ratnapura District were recipients of cash prizes accompanied by certificates.

Eastern Province.

The following extracts are from the report of Mr. C. Canagaratnam, Senior Agricultural Instructor, Batticaloa District:—

Paddy.—Paddy experiments were conducted with the view to find out the increased yields secured by selected seeds, weeding, and manuring. Tests were also made to ascertain whether cultivation on modern methods yielded more profits to a farmer, when compared with the extensive method of cultivation now practised in the district. It was found out that a profit of Rs. 21·41 per acre could be secured by using selected seed and adopting weeding and manuring. The experimental plots in Batticaloa South where manurial tests were made on the effect of different manures in Pattipalai-arū scheme have shown that fish manure and green manure acts the best when compared with the control, yielding a profit per acre of Rs. 48·63 and Rs. 47·13, as compared with profits of Rs. 22·13 on the control. This requires further confirmation. This demonstrates the fact that intensive cultivation pays much more than the ordinary extensive system of cultivation adopted in this district. It also proves as to how paddy cultivation becomes unremunerative, and one of the important reasons tending to make a farmer very unstable as far as his economical situation is concerned. It also proves that it is more profitable to a farmer to concentrate his attention on a smaller area obtaining greater yields and more profits than satisfying the vanity of having a larger amount of acres that he could manage or his labour would allow. Besides these experiments in Batticaloa North and South there were demonstration plots in the cultivators' field at different undams. There were altogether eight demonstration plots at different undams to demonstrate the advisability of improved cultivation in cultivators' own fields. Besides these, there were conducted experiments in school gardens in paddy in the three school gardens of Nindoor, Olluvile, and Oaddaimavadi.

School Gardens.—There are twenty-five registered school gardens in this division, of which twelve are Government schools and the rest are gardens of grant-in-aid schools. There was garden work carried on in all these schools, in addition there were six other schools not registered also doing garden work. Out of these twenty-five, only eighteen received prizes and bonuses, the rest not being recommended for any grant or bonus, as it was desirable that the standard of the garden work be raised. There was also agricultural instruction given at Oaddaimavadi, Eraur Government school; and horticulture lessons are being taken at Arasadi school for the training colony students to give practical study on nursery work and horticulture, and to aid this a small nursery block has been started on a very small scale at the expense of the District School Committee funds. Paddy manurial experiments are being carried on at Oaddaimavadi, Olluvile, and Nindoor to demonstrate the effect of manuring in these soils. There were also introduced into this district different varieties of Jaffna yams.

General.—A nursery block was started at Mahaoya to help the Veddas of this district in their permanent settlement, for which purpose the Government Agent of the Province has given one acre garden and two to five acres paddy land, and with a view to planting their garden lands with perennial crops, the produce of which the people can fall back on during the food shortage which usually occurs during the dry months of the year, at which time they find very little to eat; with this purpose in view coconuts, jak, limes, oranges, pomegranates, custard apple were raised and sold at the rate of 10 cents per coconut plant, and for every buyer of a coconut five other fruit plants were given free for people of this district, as they are very poor and have till now been seminomadic. This year about 500 coconuts over 1,000 jak, 1,000 limes, 1,000 oranges, 800 custard apples, and 400 pomegranates have been given over to the villagers of this pattu for planting up in the garden lands. Gate Mudaliyar Canagasabey has also distributed about 500 jak plants to the people of Bintenna and Wewagam pattu. About 500 cuttings of pepper were also introduced into Wewagam pattu where they are doing well.

Caterpillar Pest of Coconuts.—The attack of this pest was not so severe during the year under review as the previous year 1922, and Akkarai pattu, few estates, Kalkudah, and Valaichenai were badly affected. The landed proprietors who did not conform to Ordinance No. 6 of 1906 were prosecuted. There were in all nineteen prosecutions entered, out of which fourteen convictions were secured, two cases being withdrawn, and three cases being laid by. The total fines amounted to Rs. 555. The coconut industry of this district has suffered immensely from the drought experienced this year, and there has been much falling of nuts, and many trees have died. Out of four Plant Pest Inspectors employed under the Plant Pest Board, two were discontinued in June and other two were discontinued with the close of the financial year.

Province of Uva.

The following extracts are taken from the report of Mr. E. W. Dias Bandaranayake, Senior Agricultural Instructor, Province of Uva :—

Suggestions.—That the Department do take a lease of four acres of paddy land in the Badulla town to be worked by the Instructor at the spot, so that artificial manure, green manure, transplanting, seed selection, &c., could be experimented with and the Instructor could be given an opportunity of finding out whether any new varieties of paddy, &c., could not be introduced into the Province.

That the same experiments be carried out on similar lines at various paddy growing centres in the Province. That an Instructor be appointed to Wellawaya to work Buttala and Wellawaya Divisions, mainly to push forward paddy and cotton cultivations, the same Instructor to be in charge of an experiment garden which should be opened up at Wellawaya in order to experiment on cotton, bananas, coconut, and other fruit trees. From this station, villagers could be given practical lessons on the cultivation of these crops and also plants could be supplied to them at nominal rates to enable them to plant these in their own gardens. Should an Instructor be appointed, he could also work the Buttala Co-operative Society and also start one at Wellawaya.

That Sunday fairs be encouraged, whenever possible, so that the producer may get the best price for his produce, instead of having to go a very long way to get a sale for his produce. I beg to suggest that the Ratamahatmayas of the various divisions be specially written to and asked to render assistance whenever possible.

That steps be taken to improve the breed of cattle in the Province. For this the following is suggested : Legislation be passed through the Gansabhawas that all bulls and bull-calves be castrated and two or three Gansabhawas be asked to provide themselves with stud bulls (in case one Gansabhawa be not in a position to purchase a stud bull) to serve the cows of the villager belonging to their respective Gansabhawas free of charge. The stud bull is to be kept under the direct supervision of the nearest Agricultural Instructor or Stock Inspector who should report on the animal to the Government Agent every month.

School Gardens.—All registered school gardens were visited and necessary instructions were given with regard to improvements. Some of the unregistered gardens were also visited and instructions were given with a view to raise their standard, so that they may become eligible for registration in course of time. Teachers were requested to pay special attention to home gardens. Home gardens were visited during the year, and awards were given to deserving ones. Two gardens were registered early in the year and two others were recommended for registration in 1924.

Taldena Gardens.—A plot of land about an acre in extent was opened at Taldena in February, 1923, to find out whether the soil and climate here would suit cotton. This proved very successful, with the result that cotton cultivation is steadily increasing, not only in Taldena, but also in the villages round about. During October last this plot of land were increased to two acres, and prepared for Durango cotton and also planted up before the month was over. Another one-fourth acre was planted with citronella grass. If the rains do not interfere I expect good returns from the cotton plot.

Bibile Gardens.—The planting of sugar cane, tobacco, cotton, and manioc were tried during the year. The soil proved satisfactory for cotton cultivation. The soil also proved very good for tobacco cultivation. Cotton and tobacco seeds were freely distributed among the villagers, and it is hoped that the growing of cotton and tobacco will be taken up with success by the villagers in this district. In October last, this garden was extended by an extra acre being added on to it. I propose to try three different varieties of tobacco this year, and also different varieties of cotton, manioc, and sweet potatoes.

Paddy.—The manurial experiments conducted in Badulla have given satisfactory results, where sterilized animal meal and green manure were applied.

During the year transplanting of paddy has been carried out to a greater extent than in previous years, which accounts for the large number of entries for the transplanted competitions. Transplanting has spread into six divisions out of the seven divisions in the Province. I expect a few competitors from this division for the next entries. Cultivators of this Province are gradually beginning to realize the value of green manuring, and I expect greater areas will be transplanted and green manured in the near future.

Sugar Cane.—The results with regard to sugar cane plantation have not been so satisfactory as might have been expected, on account of the plants being continually attacked by wild boar. At Haldummulla a great deal of damage was done to the plants by these animals during the year. All efforts made to destroy these animals did not prove very successful, as they appear to be breeding very fast. This could be seen by the extent of the damage done. The canes at the Bibile gardens suffered considerably on account of the drought, but there are signs of improvement after the October rains.

Coffee.—Out of the 200 coffee plants introduced to Dambekotte during 1922, some of the plants died during the 1923 drought and the rest are growing satisfactorily. In 1923 another lot of 200 plants supplied by the Department was planted in the vicinity of Badulla town and they are growing satisfactorily. The different varieties could be compared when these begin to yield.

Sunday Fair.—A Sunday fair was started in Badulla at the latter part of the year. At the commencement there was a certain amount of enthusiasm, and a good many (mainly coolies) flocked in every Sunday with vegetables of various kinds—chiefly tomatoes, but latterly a good many dropped out soon after the tomato season, and during the months of November and December they dropped out altogether. I expect the Sunday fair would flourish again when the chena season approaches.

VIII.—THE WORKING OF CO-OPERATIVE SOCIETIES, 1923.

THE beginning of the year saw the end of the first decade of the working of the Co-operative Movement in Ceylon and in March the eleventh year was begun. During the year the progress of the movement was steady. The number of societies increased ; financial condition was more satisfactory. Repayment of loans except in certain areas was somewhat more punctual and the supply of manures for paddy increased. In certain districts owing to unsatisfactory weather conditions crops were damaged and the repayment of loans was delayed. Signs are not wanting to prove that the movement is spreading slowly and steadily. The official activities have increased and more attention has been paid to the working of the societies. Unofficial support from the leaders of the country is still lacking. Organizations to co-ordinate the work of the individual societies in the districts and Provinces are wanting.

PROGRESS.

Societies.—Thirty-one new societies have been registered during the year and the registration of two societies has been cancelled. The affairs of one of them were liquidated, and the liquidation of the other is proceeding. The total number of societies at the end of the year is 229, an increase of 29 for the year.

Members.—The number of members has also increased. At the end of the last year there were 21,518 members. At the end of the current year the number of members is 25,634. This shows an increase of 4,116.

Capital.—The paid-up capital has increased, the societies in the Batticaloa District contributing a good portion of the increase. The total paid-up capital at the end of the year is Rs. 222,441·48, showing an increase of Rs. 49,937·48.

Deposits.—A few individual societies have received satisfactory sums as deposits from members, but the business in deposits is not quite satisfactory as yet. The amount to the credit of members on account of deposits at the end of the year is Rs. 22,375·98.

Reserve Fund.—The amount set apart for the Reserve Fund by all the societies at the end of the last co-operative financial year is Rs. 32,142·88. This shows an increase of Rs. 7,095·71.

Loans.—The amount lent out by the societies during the year is Rs. 262,224·07, and the amount repaid by members is Rs. 221,966·32. This also shows an increase. The total amount outstanding at the end of the year is Rs. 285,789·02.

CENTRAL PROVINCE AND KEGALLA DISTRICT.

(Forming the Central Division under an Assistant Registrar.)

Mr. G. G. Auchinleck, the Assistant Registrar, Central Division, reports as follows in regard to the progress made in his division:—

During the year a considerable amount of time was given to these societies by the staff. While very marked progressive work by the societies cannot be recorded, much improvement in supervision and organization has been effected by the divisional staff. At least one visit was paid to each society by the Assistant Registrar and several by the Inspector.

The number of societies in the division is as follows:

	1922.	1923.
Kandy	20	22
Matala	4	4
Nuwara Eliya	2	3*
Kogalla	6	7
Total	32	36

* One more new society not registered as yet.

The total number of members holding shares was 3,031 and the total share capital paid-up, Rs. 26,608·69.

Five societies which have been stagnant for some years have been carefully examined with a view to deciding on their future. Of these, three attempted to cover what were probably too large areas (Walapane, Beligal korale, and Galboda and Kinigoda korales), one was founded in an area where another society already existed (Nagolla-Hulangamuwa), and one limited itself to loan work whereas its object should have been to make itself into a central society (Kandyan Association Society).

Six societies in the division are non-agricultural. In general, it seems possible that more rapid progress may be obtained if supply, trading, or stores work is encouraged; purely loan societies appear often too narrow in their scope.

Loans from Government and deposits are fairly accurate indications of the stability and prestige of any co-operative society. In this respect the societies of the Central Division are still lacking; with a borrowing capacity of about Rs. 5,400, the societies have absorbed only Rs. 2,500 of Government loans and Rs. 600 of deposits.

Decentralization of the work of supervision has been the keynote of the work during 1923; Agricultural Instructors have been kept fully in touch with the work of societies in their areas, and it can be confidently stated that the effects have been good.

In most cases the Ratamahatmayas have given valuable support officially and privately to the societies in their divisions. It has been found that short reports on the movement to the District Agricultural Committees on which Government officers, planters, and headmen sit have produced good results.

SOUTHERN PROVINCE AND KALUTARA DISTRICT.

(Forming the Southern Division under an Assistant Registrar.)

Mr. F. Burnett, Assistant Registrar, Southern Division, reports as follows:—

The progress of the societies in the division for the year has been slow, but fairly satisfactory, and considerable improvement shown over last year; many societies that were inactive are now doing good work, and the general interest taken by the workers of the societies is encouraging.

Eight new societies were registered during the year, thereby bringing the total number of societies in the division to 70, distributed as follows in the different districts:—

Kalutara District	30	Galle District	18
Matara District	18	Hambantota District	4

Number of members is 10,693. The paid-up capital is Rs. 72,242·84.

The year has been a particularly busy one, for much had to be done in assisting the societies to appoint reliable secretaries and also to rectify their by-laws so that they might be in conformity with the new Ordinance. The meetings held to do this work proved to be very useful, as they afforded a good opportunity for many members to understand and educate themselves in the proper management and working of these societies.

The greatest hindrance for the purpose of most of the backward societies is still the existence of long outstanding loans which in certain cases amount to large sums.

The distribution of manure, which forms an important part of the work done by these societies, has been much better than last year; manure to the value of Rs. 14,250 has been obtained through the Registrar, whilst Deniyaya Society has obtained manures from other sources. Weligam Korale, Ittapana, Handapangoda, Matara Wesleyan Methodist, and Kovitiyagala Societies have been the biggest buyers, each buying to the value of over Rs. 1,000. Debts due to the manure companies which were in arrears have now been all settled.

Of the societies in the division, the following deserve special mention as the best among them:—Kevitiyagala Society continues to do useful work with its paddy store; Ittapana Society has increased its business due to the untiring efforts of the new secretary; Handapangoda, Alutgama, and Mahagama Societies are maintaining their progress; Elpitiya Society till recently a much neglected society is gaining almost phenomenal development under the able management of its new secretary, Mr. Simon Sirimanne, and shows every sign of growing to one of the best in the Island. Heenotigala and Akmeemana Societies are making steady progress; Matara-Gangaboda Pattu and Kandaboda Pattu are ranking among the best in the division; Weligam Korals Society still leads the rest in the Province. Yatiyana Society is a credit to its managers; Matara Wesleyan Methodist Society has lost a very energetic and an able secretary in the Rev. Mr. Mendis, who has been transferred from the district; and Hambantota Government Servants' Society has further developed the work of its store department; of the new societies, Galla Catholics' is the best, and its progress so far is remarkably promising; East Giruwa Pattu Society, another of the new societies, is the first to be established in the pattu; its success is important and it can be of great use to the cultivators, especially to those taking to cotton cultivation, which is a new industry in the district.

The societies of the Kalutara District have been offered the "Brito-Babapulle Gold Medal" for paddy cultivation for the 1923 maha season; entries for the competition are however very poor owing to the heavy rains and consequent floods which are very unfortunate.

NORTHERN PROVINCE AND TRINCOMALEE DISTRICT.

(Forming the Northern Division.)

Mr. G. Harbord, Assistant Registrar, Northern Division, reports as follows:

"*Brito-Babapulle Gold Medal.*"—The gold medal offered for paddy cultivation during 1922 was presented to Mr. N. Swaminathan of the Colombuturai-Poonakeri Co-operative Society.

The number of Societies in the Northern Division at the end of 1923 was 32. Nine new societies were registered during the year, namely, Wesleyan Mission Agents', Vavuniya Church Mission, Valvettiturai, Nanaddan West, Mantai North and South, The Pesalai-Poonakeri Grain Bank, Karayoor Carmel, and The Timnavally.

The registration of the Jaffna Central Society was cancelled and its liquidation is in progress.

Five societies, viz. Kudatanai, Pulmoddai, Tiriya, Kutchaveli, and Talaimannar did no work during the year; and two societies, viz., Jaffna Industrial and Chavakachcheri did very little work.

The number of members at the end of the year was 2,560. The paid up capital was Rs. 40,474·51. The deposits were Rs. 17,248·53. Loans to the value of Rs. 67,757·50 were given out. The amount due to the reserve fund was Rs. 4,412·99.

The Poonakeri Co-operative Grain Bank, which was affiliated to the Colombuturai-Poonakeri Co-operative Society, was registered as a new society, and it has a membership of 67. Its share capital is 542 bushels of seed paddy, and it has given out 766 bushels and 21½ measures of paddy on loans to its members.

N.B.—The above figures are for the Northern Division excluding the Sinhalese Societies in the North-Central Province, but including the Vavuniya South Sinhalese Division, and if figures for the Northern Province are desired the following figures which belong to the Trincomalee District Society must be deducted:

Number of members, 565. Paid-up capital, Rs. 5,835. Loans given, Rs. 16,465. Loans recovered, Rs. 10,120. Deposits, Rs. 1,012·79. The amount due for reserve is Rs. 878·21.

COLOMBO DISTRICT (WESTERN PROVINCE).

Four new societies have been registered during the year, making the total number of societies in the district to twenty-three. This is an increase of two over last year. The total number for the Province is fifty-three. The societies continue to maintain their progress. The work of some individual societies such as Dakunu-Talangama, Padukka, Udugaha-Meda Depattu, Kiriwattuduwa, and Boralesgamuwa is very satisfactory. The Government Printing Office Co-operative Society has increased its activities, and substantial progress is made with its Provident Fund. Henaratgoda Society is taking an interest in the improvement of the paddy cultivation. The Uruwela Peruwa Society takes an interest in the general welfare of the villager. Employees of the Colombo Safety Matches Manufactory Society have effected savings out of their earnings through the society. Four of the societies have not been able to do satisfactory work. One society was liquidated and its registration will be cancelled.

NORTH-WESTERN PROVINCE.

Four new societies were registered during the year. Three are in the Kurunegala District, and one in the Puttalam District. The total number of societies in the Province is twelve, six in the Kurunegala District and three each in the Puttalam and Chilaw Districts. The Nainamadama, Demala Hatpattu, and Hiripitiya Societies have made good progress. The new societies have just begun work. There are prospects of these societies being started in the Province. The Pussella Society in the Kurunegala District started work with great enthusiasm, and if continued will be a very useful society in the village. The Nainamadama Society has done an immense amount of useful work within the year.

EASTERN PROVINCE.

Two more new societies were registered in the Batticaloa District, and the registration of one old society was cancelled. There are now thirty-seven societies in the Province, of which thirty are in the Batticaloa District and four in the Trincomalee District. Four of the societies in the Batticaloa District are weaving societies, and the rest are all agricultural and take special interest in paddy cultivation. Four of the old societies have ceased to work, as the members of those societies have either joined new societies or have started other societies under the new regulations. The three village societies in the Trincomalee District will be wound up. The movement has received further support from the Government officials as well as the general public.

NORTH-CENTRAL PROVINCE.

An increase of one society is recorded from this Province. The total number of societies is ten. Four societies are doing good work. The society which was to be wound up is having now some hope of restarting work. One society in the town has been able to collect some of the old loans. Owing to the failure of the crops at the beginning of this year owing to the long drought some of the loans were not recovered at due dates. Another society suffered the loss of its secretary by transfer, and its work is at a standstill.

PROVINCE OF UVA.

The number of societies remains the same, viz., seven. The proposed winding up of the Wellawaya Society will be taken in hand shortly. The societies in Wellassa continue to do good work. An attempt is being made to reorganize the town society. Local support is necessary for the progress of the movement, but is lacking except in Wellassa.

RATNAPURA DISTRICT.

No increase of societies is to be recorded in the district and the number remains at five. The Godakawela and Kahawatta Societies continue to progress, and the work is satisfactory. Balangoda Society has made a start. Office-bearers of the other two societies are not taking sufficient interest in the work.

SUPERVISION AND INSPECTION.

The inspection of societies has been carried out by the respective officers as usual. The Registrar inspected a number of societies in the Eastern Province and visited some of the societies in the Southern Division.

FINANCIAL ASSISTANCE FROM GOVERNMENT.

Seven societies have received loans from Government amounting to Rs. 16,500. Two societies have received loans amounting to Rs. 1,500 from local rice funds. The Batticaloa Paddy Bank has given on loans a sum of Rs. 53,803 to co-operative societies within the year. The balance outstanding on account of Government loans to societies is Rs. 48,857.64.

SUPPLY OF MANURE AND IMPLEMENTS.

The supply of manures has slightly increased during the year. Several societies have obtained mamoties and barbed wire. The quantity and cost of manures supplied during the year under review and the previous year are—

				Quantity,				Cost,	
				Tons, cwt, qr. lb.				Rs.	c.
1923	..	..	..	173	0	3	2	26,422	11
1922	..	..	..	78	6	0	0	11,234	30

The Nainamadama Society has taken a special interest in the supply of manures for coconuts. The society obtained the analysis of different samples of cattle manures as available in the locality through the Registrar. The Government Agricultural Chemist supplied them free of cost.

SUPPLY OF PROVISIONS, &C.

The Department of Agriculture Society and the Hambantota Government Servants' Society have supplied as usual provisions and other stores to members. The Buddhist English School Teachers' Society continued to supply books and stationery to pupils. The Nainamadama Society supplied cotton yarn to those members who are engaged in fishing industry for making nets.

SUPPLY OF PADDY.

The Poonakari Paddy Bank ceased to be a part of the Colombuturai-Poonakari Co-operative Society, and was registered this year as a separate society. Members have derived much benefits from the working of the Paddy Bank and have appreciated its working. The society deals in paddy only. Kevitiyagala, Urubokka, and Handapangoda Societies are the only other societies dealing in paddy. But proposals have been brought before several other societies during the year for starting business in paddy and grains.

FOOD PRODUCTION.

Interest in the production of food by the members of co-operative societies is daily increasing and as a rule all the societies in the rural areas devote their attention to food production. The Uruwela Peruwa Society and the Henaratgoda Society have offered prizes for improved methods of paddy cultivation and vegetable gardening. The increased supply of paddy manures has no doubt contributed to the increase of yield in paddy considerably. The President of the Pussella Society is taking a deal of interest in the improvement of paddy cultivation.

The annual prize of a gold medal offered by Dr. C. Brito-Babapulle for the increased yield by systematic cultivation of paddy, which was offered for competition in the Northern Province was won by Mr. N. Swaminathan, a member of the Colombuturai-Poonakari Society. He obtained a yield of 85 bushels per acre. He has since been elected the Secretary of the Poonakari Paddy Bank. Several societies competed. The prize has been offered for competition among the societies in the Kalutara District for the maha season.

HOME INDUSTRIES.

The four weaving societies in the Batticaloa District continue to devote their attention to weaving, and the manufactured cloths are sold to the Batticaloa Cloth Society. The proposal of the Tholpuram-Moolai Society to undertake weaving was not sanctioned. The members therefore started work under a separate company. Many inquiries have been made as regards the possibility of starting weaving schools. The Dakunu-Talangama Society has started weaving under the management of a Sub-Committee.

SOCIAL SERVICE.

The Kandy Rickshawmen's Society has supplied two more rickshaws during the year, and the society is now being approached by many rickshawmen for similar help. Its work can be extended with greatest benefit to rickshawmen if further financial support is forthcoming.

RULES, BY-LAWS, &c.

The rule 8 of the rules under section 37 of the Co-operative Societies Ordinance was amended in the year under review. The amended rule allows the borrowing power of a society with limited liability to three times the paid-up share capital of members and Reserve Fund, and extends the power of borrowing to societies with unlimited liability in certain areas up to Rs. 2,000, irrespective of the amount of the paid-up capital. A set of new model by-laws were drawn up and issued to societies. Large number of societies amended their by-laws on the new model.

LIQUIDATION.

The Jaffna Central Society was brought up under liquidation, and for the first time a liquidator, other than an officer of the Department, was appointed to liquidate the affairs of a society.

CO-OPERATIVE EDUCATION.

The annual training classes for the training of secretaries, treasurers, and other honorary workers were held this year at Jaffna, Trincomalee, Akkaraipattu, Valachenai, Chenkaladi, and Kurunegala. The classes at Kandy and Galle had to be postponed. As usual the classes were well attended and their usefulness appreciated by all those who attended them.

The students of the School of Tropical Agriculture had their lectures on co-operation as usual, and a prize for co-operation was awarded for the second time. The vernacular magazine published by the Department of Agriculture containing literature on co-operation were distributed free of cost to all co-operative societies; the demand for leaflets on co-operation in the vernacular is on the increase.

The following "Registrar's Circulars," were issued during the year:—"Increase of Share Capital" and "The Amendment of By-laws on the new Model."

A handbook on co-operation has been compiled and will be ready for printing shortly.

Peradeniya, January 31, 1924.

N. WICKRAMARATNE,
Secretary, Board of Control.

IX.—REPORT OF THE WORK OF BOTANIC GARDENS.

ROYAL BOTANIC GARDENS, PERADENIYA.

IMPROVEMENTS AND ROUTINE.

IN addition to the usual routine, several improvements have been carried out, though the progress of these has been hampered by the unusually wet weather which prevailed from the commencement of the south-west monsoon early in June.

2. The work of removing the hillock by the gravel pit, in section A, commenced in October, 1922, was completed towards the end of the year, the ground being levelled and grassed. The earth removed was utilized for filling up gaps in the river bank and hollows in the fernery and elsewhere.

3. The gradient of the north end of the Central drive, at the junction with the River drive, was reduced, and the junction itself improved.

4. A sharp bend in the River drive close by has been straightened, which necessitated considerable filling up of the steep river bank.

5. The Clove drive has been improved by reducing the gradient, lowering the higher portion, returfing the verges, and regravelling, &c.

6. *Fernery*.—Improvements and extension have been effected in the fernery, which is one of the most attractive and interesting features of Peradeniya. Portions have been filled in and raised and replanted, whilst a number of the paths have been widened and relaid. The entrance from the flower garden has been improved, and a new flight of steps built to the right.

7. Improvements carried out in the South garden included the cutting down and terracing of the cabook bank below the Director's compound, building three flights of steps, and altering the course of the Ebenaceæ walk. The work of reducing the bank involved a good deal of blasting by dynamite.

8. Much over-grown vegetation was removed from the quarters occupied in November by the Botanist and Mycologist, including the cutting down and removal of a very large Rain-tree (*Pithecolobium saman*) about 40 years old.

9. The work of filling, turfing, planting hedges, &c., at the new Entomological and Mycological laboratories, was completed in September.

BUILDINGS.

10. The coconut house, now called the Ferry arbour, in the arboretum near the ferry, presented to the Gardens by Gate Mudaliyar A. E. Rajapakse in 1912, has been rebuilt on more substantial lines and roofed with Mangalore tiles. Commanding a fine view of the river and Ganoroowa, it is much appreciated by visitors and picnic parties.

11. *Glass House*.—The superstructure of the glass house, which had become much decayed and dangerous, with much of the glass broken, has been rebuilt by the Public Works Department. The work was completed in September, after which the house was restocked with a collection of such plants as require the special protection afforded in this structure.

12. *Fern House*.—The wooden superstructure of this house was entirely replaced by the Public Works Department, the work being completed in August.

13. A new masonry-built manure pit with a concrete floor and a permanent tiled roof has been erected on the site of the former open pit, the latter having first been filled up with earth.

14. The temporary lecture hall behind the store, formerly used by the School of Tropical Agriculture, has been taken down. The iron framework, which belonged to the late Ceylon Agricultural Society, has been purchased, and is being used for erecting on a portion of the site of the old fernery near the store, for the purpose of providing a structure suitable for growing palms, &c., in pots, both for ornament and for sale to the public.

CULTIVATION.

15. *Conifer Trees*.—Many of the young trees in the conifer collection having made rapid growth and become top-heavy, have been affected by strong winds and consequently have had to be supported by stakes of the “male-bamboo” (*Dendrocalamus strictus*) during the south-west monsoon. The temperate or sub-tropical coniferous trees do not seem to have a long life at Peradeniya.

16. The large plant of Giant orchid (*Grammatophyllum speciosum*), introduced in 1856, which has for some years past been a striking object near the orchid house, has during the last few years been in poor health and gradually dwindling away, until only about two pseudo-bulbs remained. Several remedial measures have been adopted without success. Finally, as a last resource, it was entirely removed from its mound and potted, and placed in a shady corner.

17. The old plot of Assam Hybrid tea, in section F, introduced from India in 1867, and therefore now 56 years old, having been neglected for many years, was taken in hand early this year. The bushes were cut back to a height of about three feet, the ground thoroughly weeded, and the excessive shade which had been allowed to grow up removed.

18. The renovation of the fodder-grass areas along the banks of the river, which had become impoverished and unavoidably over-run with weeds, was undertaken towards the end of the year, being weeded, forked, and manured.

19. *Garden Water Service*.—Cultivation work has been facilitated by a much needed improvement effected by the Public Works Department at the intake of the Gardens’ water-pipe. A new intake chamber has been built and an inlet tank with perforated iron plates fitted.

20. *Nurseries*.—A new tank for the collection of water has been built in the Ornamentals’ nursery, and an enclosure made with wire netting for the purpose of protecting seed-pans, &c., against squirrels and birds.

ACCLIMATIZATION, &C.

21. The twelve plants of *Taraktogenos Kurzii*, the true source of the Chaulmoogra oil, used for leprosy, received in 1921 and planted out in 1922, have become well established, some being now three feet high.

21. Three plants of *Gingko biloba*, the handsome maiden-hair-fern tree of China, have made practically no progress, though still alive.

22. *Balanocarpus maximus*, the well-known timber tree of Malaya, has again failed to become established, the few plants raised from seed last year having all died.

23. *Widdringtonia dragomontana*, a handsome coniferous tree of the mountainous region of Central Africa, has again proved to be unsuitable to the climate, and died.

24. *Dendrocalamus sikkimensis*, a handsome bamboo of India, received and planted out last year has become well established.

25. *Cassia beariana*, a plant of reputed medicinal value, raised from seed received last year, has so far made but little progress, being now only a few inches high.

26. A plant of *Waciewiczia coccinea*, received by post from the Department of Agriculture, Washington, in April last, has now become well established. It is a native of Panama, and is said to be a very ornamental species.

27. Two plants of a new palm from Guatemala, under the name of *Opsiandra maya*, were received by post also from the Department of Agriculture, Washington, and promise to become well established.

ECONOMIC MUSEUM.

29. The work of labelling, renewal of specimens, upkeep of furniture, &c., has been well maintained.

30. Several additional specimens have been added to the collection, including fibres, grains, and clay models of fruits, mostly surplus specimens collected for the British Empire Exhibition.

MISCELLANEOUS.

31. *Gourami Fish*.—As these caused much damage to the plants of *Victoria regia*, *Nelumbium*, and *Nymphaea*, the lake was emptied in October, and as many of the Gourami fish as could be caught removed. Most of these were sent to Hakgala Gardens, with a view to acclimatizing them, and subsequently placing them in the Queen’s Cottage ponds for the purpose of keeping the *Nymphaea* pest in check. None, however, have survived the change.

32. A serious outbreak of smallpox, chiefly in the Central Province, which occurred in January and February, necessitated the vaccination of all the staff and labour force early in February, resulting in a number of the latter, as well as of the subordinate staff, being absent from work for several days.

33. The Superintendent inspected the new Royal College grounds, the St. Thomas’s College grounds, the University College grounds in Colombo, also the General Hospital grounds, Colombo, reporting and advising on their improvement. He also assisted and judged at the Nuwara Eliya, Gampaha, and Kandy Agri-Horticultural and Industrial Shows.

34. An illustrated pamphlet on *Fruit Culture* was written by the Superintendent, also a Leaflet on *Cannas*, both in connection with the Gampaha Show held in July.

METEOROLOGICAL.

35. The year has been remarkable for an unusually prolonged drought during the first five months, and for a record rainfall in the remaining seven months. June was the wettest month, and February and May the driest, with practically no rain. The total for the year has exceeded the average by 33.60 inches. The heaviest fall in any 24 hours was 6.08 inches on June 6. This is a record for Peradeniya Gardens.

36. Rainfall for 1923 :—

Month.	Rainfall for 1923.		Average from 1884 to 1923, inclusive.	
	Inches.	Days.	Inch.	Days.
January	14.25	14	3.93	6
February	—	—	1.60	3
March	5.78	11	4.65	7
April	4.80	10	8.32	12
May	.44	4	5.72	11
June	21.34	28	11.29	17
July	9.75	27	8.38	18
August	11.25	26	6.17	13
September	10.97	23	6.84	15
October	18.70	19	13.68	18
November	10.42	21	10.45	16
December	14.75	18	8.66	12
Total	122.45	201	89.69	148

HENARATGODA GARDENS.

37. Several improvements have been carried out, and the usual routine was well maintained notwithstanding the effects of a severe drought in the early part of the year.

38. The reclaimed portion at the south end of the gardens, referred to in last year's report, was for a considerable period under water, owing to the heavy and prolonged rains ; consequently most of the coconut seedlings and the pineapple plants died.

39. Therefore this portion was drained, wide and deep drains being cut and the soil thrown up in ridges. The surface of the latter has been planted with pineapples, cassava, pigeon-pea, and other food crops.

40. The fernery has been thoroughly renovated, all the beds being dug up and cleared of roots from overhanging trees, and afterwards manured and replanted.

41. The flower garden section has been improved, several new beds being made.

42. The visitors' shelter, presented to the gardens in 1920 by Mr. Rajapakse, has been improved, the floor being raised and cemented and some rustic seats provided.

43. A model vegetable garden was laid out and planted by the Assistant Curator, Mr. Guneratne, in connection with the Gampaha Show held in July.

HAKGALA BOTANIC GARDENS.

The following is the report of the Curator, Mr. J. J. Nock :—

“GENERAL.

“The circle outside the main gate has been metalled and the rolling of the same done by the steam roller, through the courtesy of the District Engineer, Nuwara Eliya.

“The ravine between the nursery and the old Acacia collection has been cleared and planted up with a collection of Begonias and lilies.

“The banks on either side of the ravine opposite the rose garden have been tidied up and also the area between the ravine and plant sheds.

“The lower pond has been cleaned out and the leaks in the retaining wall repaired.

“The bank on the upper side of the stream below the lower rockery has been cleared and planted with conifers of different kinds.

“The bridge over the stream below the lower pond has been rebuilt.

“The retaining wall of the raised border near the Seville orange tree below the office has been rebuilt, and the border overhauled and planted up with a collection of perennials.

“The corner of the main road below the thatched summer arbour has been cut back by the Public Works Department, and the barbed wire fence along the top of the same has been re-erected.

“The borders along the upper drive from the south-east entrance to the fernery to above the upper pond have been overhauled and replanted.

“The two triangular borders at the top of the path leading from the upper drive to the Azalea bed have been planted up with a collection of leaf Begonias, and the borders on either side of the path with *Crinum Moorei*.

“The Camellias in the collection have been cut back, and the retaining walls and drains round the collection have been rebuilt, and the Camellias labelled.

“The two triangular borders near the Camellia collection have been planted with *Crinum asiaticum*.

“The boundary fence from the main gates to above the Eucalyptus plantation has been put into good order.

“During November and December all the beds and borders were manured and planted.

“Owing to the bad weather it has been necessary to plant some of the beds no less than three times.

“Most of the plants in the beds have been protected from cut-worm by collars of Dux rot-proof paper.

“A new meteorological shed has been built by the Public Works Department on the knoll in front of the laboratory.

“THE ROCK GARDEN.

“The new extension near the entrance which was planted up early in the year has come on very well.

“Arums and Egyptian Papyrus have been planted out in the swamp above and to the left of the entrance.

“A large border on the bank near the entrance has been planted up with *Tritonia crocosmiflora*, and during November and December these produced a mass of bloom and were very effective.

“Thirty-one packets of seeds of rock plants have been received from Messrs. Sutton & Sons, Reading. Of these the following have done well:—*Leptosiphon hybridus*, *Ionopsidium acaule*, *Cerastium tomentosum*, *Erysimum linifolium*, and *Arabis alpina*. The following promise to do well, but have not yet flowered:—*Saxifraga* “Rosy Queen,” *Erinus alpinus*, *Campanula muralis*, *Aquilegia alpina*, *Dianthus deltoides*, *Crucianella stylosa*, *Arenaria balearica*, *Arenaria montana*, and Rock Pinks.

“The labelling of the plants in the garden has received attention throughout the year.

“The swamp below the pond near the entrance has been planted up with Arums, *Cyperus Papyrus*, and *Exacum*.

“A few conifers have been put out on the bank above the garden, including *Araucaria Bidwillii*, *Juniperus procera*, &c.

“Porcupines and rats were troublesome during the year and the latter did considerable damage to bulbous plants after the ripening of the *Strobilanthes* seed.

“BULB GARDEN.

“The chief work during the last four months of the year has been in connection with the opening of a sunk bulb garden.

“The site chosen for this garden is on the left of the path leading from the upper pond to the lower flower garden, and has a background of some of the best specimens of conifers in the gardens, including *Araucaria Bidwillii*, *Juniperus bermudiana*, *Cupressus macrocarpa*, *Cupressus knightiana*, *Cupressus torulosa*, &c.

“At the time of writing there still remain a few rocks to be removed, but it is hoped to have this work completed before the end of January, when the paths, beds, and borders will be formed.

“Rails all round the garden for the support of creepers are to be erected on brick pillars as soon as possible. Rails for the purpose have been kindly promised by the Engineer, Way and Works Department, Ceylon Government Railway.

“A collection of bulbs has been ordered from Messrs. Barr & Sons, Messrs. Grullemans, and the Yokohama Nursery Co.

“FERNERY.

“The chief work during the early part of the year was the opening up of the jungle to the south-east of the fernery, for the purpose of establishing a collection of Ceylon ferns. Most of this area has now been planted up.

“Some large specimens of *Alsophila crinita* have been planted and have become well established.

“The stream has been cleaned up and the banks rebuilt and planted up with a collection of ferns and *Begonias*.

“The two raised borders along the lower path have been reformed and planted with *Asplenium ulbiferum*, with an edging of *Begonia Rex* in front and a row of *Alsophila* at the back.

“Plants of *Coleus inflatus* have been collected in the jungle and planted out in various parts of the fernery.

“The path leading from the *Camellia* collection has been widened and remade, and the border along the stream side planted up with *Adiantum*.

“ROSE GARDEN.

“The roses were pruned back during November and have made good growth.

“The standards have not done at all well and several have died.

“The four inner borders have been given a dressing of sterilized animal meal and vacancies in these and the outer borders have been filled.

“The fence which was blown down during the south-west monsoon has been renewed.

“AZALEA AND BERBERIS COLLECTION.

“The grass bank previously devoted to the collection of succulents has been resloped, returfed, and planted up with four large beds of white, red, and magenta Azaleas, and twenty beds of the following *Berberis*:—*B. atocarpa*, *B. angulosa*, *B. consimilis*, *B. Leschenaultii*, *B. orthobotrys*, *B. sargentiana*, *B. Stapfiana*, *B. Wilsonæ*, *B. subcaudialata*, *B. polyantha*, *B. aggregata*, *B. dictyophylla*, *B. Franciscii*, *Ferdinandii*, *B. gagnepainii*, *B. Hookeri*, *B. Prattii*, *B. Veitchii*, *B. Darwinii*, *B. Thunbergii*, *B. aristata*.

“Most of the above have been raised from seed received from the Director, Royal Botanic Gardens, Kew.

“Several of the Azaleas purchased from The Yokohama Nursery Co. have flowered well during the year.

“SHRUBBERIES.

“The shrubberies below and above the drive near the *Camellia* collection and on either side of the drive near the upper pond have been thoroughly overhauled and replanted, and also the shrubbery on the right of the path leading from the upper drive to the Azalea bed.

“The corner of the shrubbery near the Seville orange tree has been cut back, so as to improve the turning up to the bungalow.

“*Loranthus* and dead wood have been removed from the trees in these shrubberies.

“The shrubberies were pruned during July and August.

" NURSERY.

" The two sheds have been rebuilt and the nursery kept well stocked with plants.

" Over 83,000 roots of *Paspalum* were supplied during the year.

" Plants to the value of Rs. 370·35 were sold during November.

" FOREST TIMBER EXPERIMENTS.

" Rows of the following were put out in the clearing above the Camphor plantation in January:—*Acacia pruinosa*, *Casuarina stricta* (Drooping She-oak), *Casuarina distyla* (Stunted She-oak), *Hakea saligna* (Willow Hakea), *Eucalyptus maculata* var. *citriodora* (Lemon-scented gum), *Syncarpia laurifolia* (New South Wales turpentine tree), and *Tristania conferta* (Queensland Box).

" NOCK MEMORIAL.

" The Public Works Department have reshingled the roof of the Memorial, and have whitewashed the inner and outer walls. The windows have been repaired and the valancing boards renewed.

" The tables and chairs have been repaired and the surroundings of the Memorial kept in good order.

" The lavatory below the Memorial has been put into good order.

" PATHS AND DRIVES.

" The paths and drives were attended to during February and put into good order.

" The path leading from fernery to rock garden has been widened and remade.

" The drive from the south-east entrance of the fernery to the culvert above the upper pond has been widened and made uniform in width throughout and the stone edgings relaid.

" The bank and drain along the drive above the upper pond have been rebuilt, as also the retaining wall of the drive, and the Anthericum edgings replanted.

" The corner of the drive near the south-east entrance of the fernery has been cut back and the drain rebuilt.

" TEA.

" Specimens of plants raised from cuttings were submitted to the Director of Agriculture.

" 356 cuttings were inserted in two beds in the nursery on April 19, and the specimens sent were taken up on October 27, and had therefore been in the ground 6 months and 7 days, or 190 days.

" Out of the total number of cuttings inserted only 21 or 6 per cent. died.

" The cuttings selected for the experiment were on an average 18 inches long and $\frac{1}{4}$ to $\frac{1}{2}$ inch thick. An average of 8 inches of the cuttings was inserted in the ground.

" With regard to the period taken for tea seed to ripen, experiments at Hakgala show that the period taken is approximately 9 months, although in one case a period of 11½ months elapsed between the date on which the flower was fully open and when the seed was ripe.

" The chief flowering periods at Hakgala appear to be November-February and June and July.

" STROBILANTHES.

" Seed of the following species of *Strobilanthes* was collected during March and April and sown in the arboretum above the fernery:—*Strobilanthes sexennis* Nees, *S. calycinus* Nees, *S. pulcherrimus* And., *S. viscosus* And., and *S. anceps* Nees.

" With the exception of *S. anceps*, all the seed germinated well.

" CINCHONA.

" Seeds of the following kinds of *Cinchona* have been received from the Manager, Munsong Cinchona Plantation, Kalimpong P. O., Bengal:—*C. Ledgeriana*, *C. succirubra*, and *C. officinalis*.

" Seed of *C. succirubra* has also been received from Mr. R. B. Black, Clarendon, Nanu-oya.

" A sample of bark of *Cinchona succirubra* has been sent to the Director of Agriculture for forwarding to the British Empire Exhibition.

" WATTLE BARK.

" Samples of bark of *Acacia decurrens* and *Acacia mollissima* for the British Empire Exhibition have been forwarded to the Director of Agriculture.

" INTRODUCTIONS.

" Plants and seed have been received from the following:—The Forest Botanist, Dehra Dun; J. W. Paynton, Stipendary Magistrate, Auckland, New Zealand; the Director, Stazione Agraria Sperimentale, Bari; the Director, Experiment Station of Forestry, Taihoku, Formosa; W. Nock, West Hagley, Worcestershire, England; and the Manager, Munsong Cinchona Plantation, Kalimpong; Bengal.

" And from the following in the Island:—John Cotton, Tredorne, Ambawella; John Horsfall, Craig, Bandarawela; K. L. Gordon, Uvakellie, Madulsima; Miss Richardson, Nuwara Eliya; Mrs. A. M. MacNeill, Arapolakanda, Tebuwana; R. B. Black, Clarendon, Nanu-oya; Miss Tilly, Galkandewatta, Talawakele; and Mrs. N. K. Jardine, Peradeniya.

" REVENUE.

" The amount realized by sales of plants and seeds for the twelve months ended December 31 was Rs. 924·71, and for the twelve months ended September 30, Rs. 831·31.

" The value of the plants issued gratis to Government institutions, &c., was Rs. 356·15.

“ THE WEATHER.

“ The number of inches of rain recorded during the year was 117·16, falling on 253 days, compared to 84·27 inches on 117 days during 1922.

“ The wettest month was December, with a rainfall of 18·46 inches; and the driest month February, with ·04 inch.

“ The highest temperature in sun's rays was 154·3 on October 13 and November 3, compared with 159·2 on February 20 of the previous year.

“ The lowest temperature on the grass was 39·3 on February 6, compared with 30·3 on December 28 of the previous year.”

NUWARA ELIYA GARDEN.

The curator, Mr. J. J. Nock, reports as follows :—

“ GENERAL.

“ The chief work during the twelve months has been the filling up of the swamp between the tennis court and the raised path leading from the War Memorial to the drive below the rose garden. The lawns surrounding the swamp and the mound near the Peace Tree have been levelled and the soil used for filling the swamp. The reclaimed swamp has been provided with underground drains.

“ The pond round the fountain has been cleaned out, the fountain repaired, and the water pipe renewed.

“ Bad patches on the lawns have been returfed and the removal of the coarse grass, *Sporobolus indicus*, has been continued throughout the year.

“ The roses have been pruned and the cuttings inserted in the nursery, and the borders have been well manured.

“ All the seats have been repaired and painted, and the lawns, paths, drives, and shrubberies kept in good order during the year.

“ During September and October all the beds and borders were manured and replanted.

“ The levelling and returfing of the area between the main road and river have been continued.

“ Over twenty-five kinds of *Gladiolus* have been ordered from Messrs. Sutton & Sons, Reading, for planting out early in 1924.

“ WAR MEMORIAL.

“ A row of *Cupressus* has been planted round the edge of the War Memorial lawn to form a hedge, and along the top of the drain below the Memorial a row of *Frenela rhomboidea* has been put out.

“ The surroundings of the Memorial have been kept neat and tidy, and the lawn, which has become well established, has been kept regularly mown.”

THE GOVERNOR'S AND COLONIAL SECRETARY'S GARDENS.

THE KING'S PAVILION GARDEN, KANDY.

The extensive gardens and grounds have, on the whole been well maintained, notwithstanding some reduction in the labour force in favour of Queen's House Garden. Most of the pot-plants were repotted and the borders forked and manured.

THE LODGE GARDEN, KANDY.

The beds, borders, lawn, &c., have been maintained in good condition.

QUEEN'S HOUSE GARDEN, COLOMBO.

Several alterations and improvements have been carried out, the chief of which is the addition to the garden of an important portion taken from the Gordon Gardens adjoining, including an ornamental fountain. This portion has now being separated from the latter garden by an iron fence and a border of tall shrubs, &c. A number of superfluous trees were cut out and removed, and others pruned and shaped. Several old trees along the house frontage were also cut down and removed.

The collection of *Spathoglottis* orchids have done remarkably well, being in blossom throughout the greater part of the year.

QUEEN'S COTTAGE GARDEN.

The Hakgala Curator reports :—

“ General.

“ The general condition of the garden and grounds has been well maintained.

“ The ponds have been kept as free as possible from water lilies. Several of the bunds of the ponds gave way during the year and had to be rebuilt.

“ The corner of the main road below the house has been cut back by the Public Works Department, and a *Spiraea* hedge has been planted along the top of the same. The path leading from this corner and along the fence to the house has been done away with, and a new path leading from near the north entrance gates to the house made instead.

" Flower Garden.

" Several new beds and borders have been made on the lawns near the house, and have been planted up with annuals and perennials.

" The annuals which have been planted out for next season's flowering have suffered a great deal from the bad weather, and it has been very difficult to keep the vacancies caused by " damping off," filled.

" Two long borders have been made on the lawn in front of the garage. These have been planted up with mixed annuals, &c., to provide cut-flowers for the house.

" Vegetable Garden.

" Owing to the continual rains experienced from May until the end of the year, the cultivation of vegetables has been very difficult, and it has been impossible to keep up a good supply.

" The vegetable garden above the stables has been planted up with annuals and perennials for the purpose of supplying cut-flowers for the house.

" Hares continued to be troublesome during the year and have done a good deal of damage to the vegetables, carnations, &c.

" Owing to " Club Root," it has not been possible to grow cruciferous vegetables successfully, but it is hoped that better results will be obtained in the newly opened vegetable garden, where a new seed shed has been erected to raise seedlings for this garden only, and so avoid the introduction of plants from the old vegetable gardens where this disease is so troublesome."

CUDDESDON GARDEN.

The Hakgala Curator reports :—

" General.

" In addition to the general upkeep of the gardens and grounds the following improvements have been carried out :—

" An ornamental pond has been made in the swamp below the vegetable garden, and the surroundings planted up with Arums, *Exacum*, *Cyperus Papyrus*, *Crinums*, *Hemerocallis*, *Agapanthus*, and Tree Ferns.

" Clumps of yellow *Nymphæa* have been planted in the pond.

" A few paths have been opened up through the trees to the south of the tennis court. The undergrowth in this area has been thinned and a collection of shrubs and lilies planted out.

" The piece of patana land facing the new Golf Club has been tidied up and planted with a collection of shrubs.

" The *Eucalyptus robusta* trees between the *Cryptomeria* avenue and drive have been cut out to encourage the growth of the *Cupressus* planted in this area.

" Vegetable Garden.

" Owing to the bad weather experienced throughout the latter half of the year, the growing of vegetable has been very difficult.

" The pear trees produced a heavy crop of fruit early in the year.

" The drain leading from the bungalow-keeper's premises to the lower portion of the kitchen garden has been put into good order by the Public Works Department.

" A few rows of Lucerne seed imported from Australia have been sown in the upper vegetable garden, but the seed has not germinated well.

Peradeniya, January 31, 1924.

H. F. MACMILLAN,
Superintendent of Botanic Gardens.

X.—REPORT OF THE WORK OF THE PUBLICATION DEPÔT AND CENTRAL SEED STORE.

THE demands on this store are increasing and general; and it is a satisfactory sign that small cultivators from remote villages frequently apply for their requirements. The advantage of being able to have one's own vegetable or flower bed at a nominal cost appears to be more and more recognized in the fact that applications are being received daily from all classes. The supplies are obtained at regular intervals from various countries and sources. These include England, France, America, Philadelphia, Australia, Japan, Calcutta, Federated Malay States, Java, Bangalore, Mysore, Salem, Madras, Poona, Coimbatore, &c. The well known firms from whom supplies are drawn are a guarantee of purity and quality. They are Messrs. Carter & Sons, Messrs. Vilmorin Andrieux & Co., Messrs. W. Atlee Burpee, Messrs. Brunnings, Ltd., Messrs. Sutton & Sons, and Government Farms abroad.

The demand for seed paddy was rather limited, indicating settled conditions in this respect in owners and cultivators being enabled to conserve their requirements.

Seeds and cuttings of green manure plants have been in greater demand ; while 104½ lb. of Java kapok seed imported from Buitenzorg were eagerly taken up, mostly by estates. A great demand existed for seeds of hedge plants, 651½ lb. being disposed of.

21,300 pineapple suckers were dealt with during the year ; jak seed was required in the North-Central Province in order to popularize this useful tree in the villages ; while the Eastern Province was interested in a similar effort in regard to fruit trees.

Cotton was sought after enthusiastically by many in various centres, the quantity distributed representing 15,283 lb. (including special lot imported from South Africa).

Of grafted fruit plants, 675 were distributed. Following is a summary of the distribution :—

		Seeds, &c.			
		Bushels.	Pounds.	Packets.	Number.
Paddy	..	170	—	—	—
Dhall	..	—	18½	—	—
Maize	..	—	50½	—	—
Sorghum	..	—	7½	—	—
Castor	..	—	¼	—	—
Green manure seeds and cuttings	..	—	1,692	—	1,500
Albizzia	..	—	28	—	—
Groundnuts	..	10	258½	—	—
Coffee seeds	..	—	10½	—	—
Artichoke	..	—	59	—	—
Yams	..	—	1	—	—
Innala	..	—	5½	—	—
Hedge plant seeds	..	—	651½	—	—
Kapok	..	—	104½	—	—
Papaw seeds	..	—	10	—	—
Vegetable seeds	..	—	369½	21,554	—
Flower seeds	..	—	2½	2,648	—
Curry stuffs	..	—	3	379	—
Pineapple suckers	..	—	—	—	21,300
Cluster beans	..	—	77	—	—
Jak seeds	..	—	—	—	5,000
Cassava cuttings	..	—	—	—	500
Sweet potato cuttings	..	—	—	—	2,200
Lunumidella seeds	..	—	½	—	100
Oil palm seeds	..	—	—	—	600
Cardamom bulbs	..	—	—	—	250
Dwarf coconuts	..	—	—	—	75
Fruit tree seeds	..	—	¾	—	2,928
Cotton seeds (Cambodia)	..	—	4,292½	—	—
Cotton seeds (Durango)	..	—	2,438	—	—
Cotton seeds (South African)	..	—	8,693	—	—
Grafted plants	..	—	—	—	675
Teak seeds	..	—	27	—	—
Total	..	180	18,800½	24,581	35,128

PUBLICATIONS.

There has been a general advance in the number of subscribers.

The advertising rights have been sold to the Ceylon Advertising and General Publishing Agency of Chatham street, Colombo, from January, 1924.

The following is a list of publications available at the dépôt :—

Title.	Annual Subscription.		Single Copy.	
	Local. Rs. c.	Foreign. Rs. c.	Local. Rs. c.	Foreign. Rs. c.
"Tropical Agriculturist"	10 0	15 0	1 0	1 25
Bulletins	1 0	2 50	0 15	0 40
Leaflets	—	—	0 5	0 15
Annals	2 50	6 0	—	—
Circulars	—	—	0 15	0 40
"Govikam Sangarawa"	0 50	1 0	0 6	0 15
"Kamat Tholil Velakkam"	0 50	1 0	0 6	0 15

Special Centenary Edition of the Royal Botanic Gardens, Peradeniya, Rs. 5.

FINANCIAL.

The total outturn during the year (1922-23) in money-value represents Rs. 26,427·03, as compared with Rs. 20,280·35 during the past year—made up of Rs. 16,770·76 by sale of publications and Rs. 9,656·27 by seeds, &c., the latter including Rs. 3,207·64, value of free distribution to schools, home gardens, and villages.

DEPARTMENT OF AGRICULTURE.

REPORT OF THE DIRECTOR OF AGRICULTURE FOR 1924.

SECTION I.

AGRICULTURE IN CEYLON.

THE weather conditions were, on the whole, satisfactory during the year. In the tea-growing areas no severe droughts were experienced, and the south-west monsoon was generally mild. Heavier rains than usual were, however, experienced during September, and the latter part of the year was wetter than usual. In the rubber-growing districts the south-west monsoon period was abnormally wet, and in consequence outbreaks of secondary leaf fall and pod rot and of canker were common. In the coconut districts the season was favourable, but very heavy rains were experienced during the months of September and October.

Tea.

2. The tea industry has had another exceedingly prosperous year. Crops have been good, and high prices have been maintained. The teas have been carefully manufactured, and good quality has been maintained. The total exports amounted to 203,278,476 lb. of black tea and 1,651,831 lb. of green tea of a total value of Rs. 204,930,307, as against a total export of 181,939,731 lb. of a value of Rs. 185,686,387 during 1923.

3. Tea throughout the Island is looking healthy and vigorous as the result of liberal cultivation and manuring programmes which have been adopted during the past three years. Pests and diseases associated with defective cultivation have become less troublesome, and crop yields are steadily increasing. Every endeavour is being made to enforce fine plucking, and careful attention continues to be given to manufacture in the factories, in order that the high quality of Ceylon tea may be maintained. Considerable sums continue to be spent upon the improvement of factories, and material improvements in the housing accommodation for labourers continue to be made. The industry is endeavouring to so improve its buildings and factories as to comply with all the demands of modern requirements.

4. No very serious outbreaks of pests or diseases occurred during the year. Shot-hole borer is considerably less prevalent upon estates where good cultivation and liberal manuring have been practised, and the latest results of the investigations being made into this pest confirm that it can be controlled by the applications of manure, which ensure vigorous growth of the tea bushes. Tea termites continue to be the most serious pests of tea in some districts and appear to be on the increase. Experiments are being made with fumigants. Tea tortrix was markedly prevalent in some districts, and a systematic collection of egg-masses was carried out. An outbreak of nettle-grub occurred in the Morawak korale towards the end of the year. Investigations into the "Witches' Broom" disease have been continued, and it appears probable that the disease is due to physiological causes connected with the physical or chemical composition of the soil. A larger number of diseased tea seedlings have been submitted to the Department of Agriculture for examination, and in all cases the trouble has been caused by soil organisms.

5. The total number of tea plants sold under permit during the year was 2,755,116—sufficient to plant up nearly 900 acres. There have also been some extensions of area which have been planted up from nurseries established upon the properties themselves. In the Central Province there has been a demand for small areas of land by small growers for tea cultivation. Lectures to small growers have been held by officers of the Agricultural Department in the Central Province at various centres, and there is no doubt that the result of these lectures is being shown in better and cleaner cultivation by the small growers and by a better comprehension of the regulations governing the control of pests and diseases.

6. The question of soil erosion which was brought to the notice of the agricultural industries in 1923 has received careful consideration during the year under review. There is no doubt that this is a question of outstanding importance to the Colony's planting industries, and that it requires the most careful consideration. Losses of soil fertility from erosion have, in the past, been very considerable, but estates are endeavouring to prevent it as far as possible. Drains are receiving careful attention, and their edges are being planted with close growing grasses, contour hedges are being established and the use of leguminous cover crops tried. There has been an increased demand for seed of the new types of green manure and cover plants, and imports of seed from other countries have been made by estate agencies and proprietors.

Rubber.

7. The output of rubber was restricted throughout the whole year, the export percentages of standard output being 60 per cent. from January to July, 55 per cent. from August to October, and 50 per cent. for the months of November and December. The total export of Ceylon-produced rubber was 37,036 tons of a value of Rs. 63,749,711, as against 37,070 tons of a value of Rs. 73,594,349 in 1923. During the months of November and December 26,545 gallons of fluid rubber latex were exported as

against negligible quantities during the first ten months of the year, and it was, therefore, thought desirable to bring rubber latex exports under the effects of the Rubber Restriction Ordinance. The total number of rubber estates at the end of 1924 was 4,250 above ten acres in extent and 24,432 under ten acres. Their acreage amounted to 461,025 acres as follows :—

				Acres.
Estates of 10 acres and over	..	..	..	415,155
Estates of under 10 acres	..	..	..	45,870

It is estimated that 65 per cent. of the whole acreage is under European ownership and management.

8. The average price at local auctions was 75 cents per lb. for the whole year. In January and February, the prices for top grades ranged around 78 cents per lb., but the prices declined to 52½ cents per lb. for smoked sheet and 54½ cents for contract crêpe in the month of June. Thereafter, prices showed a continuous rise until, at the end of the year, sales at Re. 1 per lb. were recorded. Throughout the year crêpe rubber has obtained a small premium over sheet rubber, and fair exports of sole crêpe have been made.

9. Most estates continue to give close attention to diseases and make use of disinfectants for the prevention of those affecting the bark. Small growers, however, still pay but little attention to these diseases, unless their properties border upon larger estates, or they have been influenced by the Plant Pests and Diseases Inspecting Officers of the Department of Agriculture. The manurial experiments being carried out with a view to ascertaining if pod and leaf disease can be controlled or influenced by means of manuring have been continued, and investigations into Brown bast are still being undertaken. Little interest has been shown during the year in the budding of rubber, but the Department of Agriculture and the Rubber Research Scheme hope to be able to induce estates to take the preliminary steps of ascertaining their best yielding trees and of determining the consistency of the yield of such trees. The second year's examination of the yields of individual rubber trees of known parentage has been completed at the Experiment Station, Peradeniya, and the results have been published for general information. The Rubber Research Scheme has continued to do good work which is appreciated by the industry, and it is hoped that it may be possible for this scheme at an early date to undertake detailed investigations in the budding of rubber and into the use of leguminous cover crops.

Tobacco.

10. The tobacco season was a favourable one, but difficulties were experienced in regard to the disposal of the chewing type in India. In consequence, a large number of growers in the Jaffna peninsula have decided to turn their attention to the cultivation, for export to Europe, of the Burley type which has been experimented with for several years by the Department of Agriculture. Sixty-six growers have this year undertaken the growth of this tobacco, and the total acreage is approximately 40 acres. The prices for crop shipped to England during the year were satisfactory. This type of tobacco is well thought of on the English market, and a constant demand appears to be assured. A Government purchase scheme has been inaugurated in connection with the growing of this Burley tobacco, but it is hoped before long to convert this into a co-operative agency amongst the growers themselves. It is probable that this type of tobacco can be grown in other parts of the Island, and now that its cultivation appears to have been established in the Jaffna peninsula, trials will be made in other districts.

Coconuts.

11. The exports of coconut products and their value during 1924 were as follows :—

				Value, Rs.
Coconuts, fresh	..	No.	29,121,041	2,499,088
Copra	..	cwt.	1,769,189	31,008,191
Desiccated coconuts	..	cwt.	871,341	21,963,695
Oil	..	cwt.	552,633	15,826,782
Poonac	..	cwt.	156,251	942,685
Fibre, bristle	..	cwt.	168,247	2,024,939
Fibre, mattress	..	cwt.	312,245	922,671
Coir, yarn	..	cwt.	117,199	2,140,753

12. These exports show a large increase on the previous year, and were slightly larger than the 1922 crop. Exports of nuts showed a marked increase, there being a very keen demand from the United Kingdom and from Germany. Copra and coconut oil exports were considerably in excess of the 1923 figures, but were only slightly greater than the exports of the previous year. The exports of desiccated coconuts considerably increased, especially to Germany, Holland, and Australia. Exports of all grades of fibre also show increases.

13. The prices for coconut products were satisfactory, and the industry can be said to have had a favourable and prosperous year.

14. The coconut caterpillar (*Nephantis serinopa*) has been recorded from a large number of districts during the year, but does not, at present, occasion serious damage in the wetter areas. Black beetle and red weevil continue to be prevalent in certain areas, and active steps were taken during the year against these pests in the Matara District. Bud rot appears to be on the increase on some estates, but is not very general. Leaf disease occurs on badly cultivated estates, but nut fall was considerably less during the year.

15. A demand for the establishment of a special Coconut Research Scheme was agreed to by Government during the year, but the Legislative Council found itself unable to vote the necessary funds.

Cacao.

16. The exports of cacao were 69,351 cwt., valued at Rs. 2,464,103, as against 60,904 cwt. in 1923. The season was a fairly satisfactory one, and most estates harvested crops in excess of those obtained in the previous year. The weather conditions were on the whole rather too wet for cacao, and a large amount of canker was in evidence in certain months. The percentage of "black" cacao, although high, was less than during the previous year. The quality of the first grades were up to the usual high standard

of Ceylon cacaos. Further experiments on the fermentation of cacao were made during the year, and the resulting cacaos were examined by the scientific department of Messrs. Cadbury Bros., Ltd. These experiments indicated that Ceylon cacaos are considered under-fermented by some manufacturers, but that they command high prices on the world's markets by reason of their good appearance and uniform grading. The Peradeniya Chocolate Company continued operations during the year.

Cardamoms.

17. The weather conditions were favourable to this crop, but the exports amounted to only 2,667 cwt., as against 2,788 cwt. in 1923 and 4,096 cwt. during 1922. There is evidence that some of the cardamom plantations have declined in productivity, and there is a tendency to replace with tea areas which are not yielding well. It is unlikely that there will be any extension of the area under cardamoms, and exports are not expected to increase. Prices were steady throughout the first nine months of the year, but during the last three months there was a marked rise in value. A very keen demand for this product was evident.

Fibres.

18. The experiments with cotton in the Hambantota District were a continued success. A total crop of 733 cwt. of seed cotton was obtained from cotton grown by small growers and sold at Rs. 25 per cwt. to the Spinning and Weaving Mills of Colombo. For the 1924-25 crop an area of 1,500 acres of cotton in the Hambantota District was being grown by small growers, and in other districts further trials are being continued. The quality of the cotton was quite satisfactory.

19. During the year the opening of the Sisal Factory at Maha Iluppallama took place, and production of sisal began to be regularly made. The small sisal mill at the Experiment Station, Anuradhapura, has also worked during the year. Good quality fibre has been prepared, and it has been very favourably reported upon by buyers in London. A price of £44. 15s. per ton was received from the Experiment Station fibre, and even higher prices have been obtained from the Maha Iluppallama estate. There appear to be good prospects before sisal in Ceylon, and further extension may be looked for.

20. The exports of kapok amounted to 6,270 cwt. of a value of Rs. 350,604. Prices were lower than during the previous year.

Cinnamon.

21. The exports of this product were as follows:—

	Cwt.
Cinnamon quills	34,547
Chips	12,937

The export of quills was nearly 2,000 cwt. in excess of the export of the previous year. Prices were good, and the demand for this product was keen. Methods of cultivation do not change, and there is no extension of the planted area.

Citronella.

22. The exports of citronella oil amounted to 1,433,381 lb. of a value of Rs. 2,941,291, as against 1,121,271 lb. of a value of Rs. 2,130,283 during 1923. The exports were the highest since 1915. The prices were fairly steady throughout the year, but showed a marked reduction on the prices of the previous year. The difficulties experienced in 1923 by reason of heavy adulterations with alcohol have started, inquiries being made for guaranteed pure oil. This is, however, difficult to secure, as adulteration with kerosine by the small middleman appears to be general.

Papain.

23. The exports during the year amounted to 457 cwt. of a value of Rs. 317,893. The demand for Ceylon papain remained steady, and satisfactory prices ruled during the year.

Foodstuffs.

24. The paddy crops were about average throughout the Island, but in some districts considerable damage was done by flooding. Prices ruled high during the middle of the year in consequence of the serious floods in South India, but towards the end of the year the price of rice fell considerably.

25. The selection of high-yielding pure-line strains of paddy by the Department of Agriculture has been continued, and some of the trials of these varieties which have been made by growers have been successful. An extension of these trials is likely to take place as a number of high-yielding types are now available for distribution. The competitions and demonstrations organized by the Department of Agriculture are becoming more and more popular, and the areas of well cultivated paddy lands are gradually increasing.

SECTION II.

WORK OF THE DEPARTMENT OF AGRICULTURE.

26. Details of the work of the various divisions of the Department are given in the Annexures I.-X., and it is only necessary here to review this work briefly.

Agricultural Investigations.

27. The following experiment stations were maintained by the Department during the year:—

Major.—Peradeniya, Anuradhapura, Jaffna, and the Coconut Trial Ground at Chilaw.

Minor.—Weligama, Batapola, Bandaragama, Balangoda, Godakawela, Bibile, Dandagamuwa, Nalanda, and Trincomalee.

Cotton Experiment Stations at Ambalantota, Meegahakiula, and Embilipitiya.

Paddy Experiment Stations at Illuppachena and Nindoor in the Batticaloa District.

Bunchy Top Disease of Plantains—Experiment at Rambukkana.

28. At Peradeniya the main experimental work is concerned with tea, rubber, cacao, coffee, fodder grasses, green manures, &c. The tea plots are under manurial experiment, and the highest yields are obtained from the two plots which are planted with dadaps and albizzias. Gliricidia as a shade tree

for tea has given very encouraging results at this station, and 33,150 cuttings were supplied during the year. The rubber experiments consist of manuring experiments, trials with various tapping systems, and individual yield experiments. The results of these experiments are presented to the Board of Agriculture annually, and are published for general information. The plot of budded rubber is making satisfactory progress and is being watched with interest. The manurial experiments on this station indicate that increased yields are not obtained as the result of manuring, but it is not to be concluded from these results that increase in yield will not result from the applications of manure to rubber growing on other soils. It is now generally accepted that manuring on poor, washed, lateritic soils is necessary in Ceylon if average yields and vigorous growth are to be maintained. Experiments in the fermentation of cacao were made during the year, and a report on the samples so prepared was received from Messrs. Cadbury Bros., Ltd. These experiments showed that Ceylon cacao was regarded by chocolate manufacturers as being under-fermented, but no change in the present method of manufacture is to be recommended in view of the special prices which are at present paid for the Ceylon product. The experiments with different varieties of coffee have been continued, and general interest in these trials is maintained. The planting of different varieties of coconuts has been continued, and the experiments with various fodder grasses pursued. Samples of roselle fibre (*Hibiscus sabdariffa* var. *altissima*) were prepared during the year, and valued at Rs. 285.80 per ton in Calcutta and £27 per ton in London. The yield figures on the experiment station indicate that gross returns of Rs. 200–250 per acre could be secured from this fibre. It is being grown as a catch-crop amongst young rubber in Malaya, and might be worthy of consideration as a catch-crop in young rubber in the wetter parts of Ceylon. The work that was done last year on the question of soil erosion has resulted in a demand for seed of leguminous cover crops. *Vigna oligosperma*, *Indigofera endecaphylla*, *Centrocyba pubescens*, and *Desmodium triflorum*, amongst the creeping and trailing plants, have given very good results at Peradeniya and are worthy of trial upon all estates. Of the shrubby plants, *Tephrosia vogelii*, *Clitoria cajanifolia*, *Crotalaria ussaoensis*, and *Crotalaria anagyroides* are recommended for trial. The attention of agriculturists is also drawn to the crops of adlay (*Coix lacrymans* var. *Bakindoun*) which have been grown. This food grain should be a valuable addition in the Island's food grains, and is worthy of extensive trial.

29. At Anuradhapura the experiments with sisal have been continued. The older plots which were planted in 1918 and early 1919 poled considerably in 1923 and 1924. Careful records of polling is being kept, so that the average life of a sisal plantation in the dry zone of Ceylon may be ascertained with accuracy. Other records show that an average of 40–45 leaves mature annually per plant, and the average weights of such leaves range between 1 and 1½ lb. per leaf. The small scrutching machine has been worked continuously during the year except during the wet months, and details of cost of cultivation and of extraction are now being worked up. This experiment with sisal at Anuradhapura was laid down in order to ascertain whether the cultivation of this fibre could be recommended for village cultivators for their high lands, small mills being established at different centres at which leaves would be purchased for cash. The figures which have been secured so far seem to indicate that such a procedure will be profitable, and, if the final results which are now being carefully scrutinized bear out the preliminary investigations, a solution to the economic development of the dry zone of the Island may be formed, and industrial undertakings introduced to areas that know, at present, little or nothing of the prospects of industry. The experiments with limes are yielding interesting results, and ready sale for green limes is being obtained. A shipment of oil-palm fruits grown on this station was sent to England during the year and was dealt with by the machine which had been erected by the Nigerian Products Company at Wembley. The kernels were above average size and contained a good oil content. They cracked well and were well reported upon. The yields at Anuradhapura per palm have been disappointing, and do not compare with the yields which have been secured in cultivations in Sumatra. It is possible that these low yields may be due to the dryness of the climate, and that better results would be secured on the wet side of the Island. Further trials with oil palms are recommended along the trace of the Batticaloa Railway, and particularly in the Mahaweli-ganga valley. The kapok cultivation at the station is thriving, and should give valuable results. A considerable amount of work has been done during the year in the opening up of the new paddy area. This land is required for the multiplication of the pure-line strains which are being raised by the Economic Botanist on the older paddy fields of the station. This work is of the utmost importance for the improvement of paddy varieties, and may assist considerably towards increasing the average yields of paddy crops in the Island. At the Jaffna Experiment Station, selection experiments with chillies, tenai, and kurakkan have been continued; experiments with White Burley tobacco carried out and trials with fodder crops made. As the result of the work of this station, White Burley tobacco is now fairly established in the Jaffna peninsula, and 3,864 lb. of cured tobacco were shipped during the year to London and fetched on the London market 1s. 7d. per lb. A considerable extension of the area grown with White Burley tobacco will take place next year, and the establishment of a co-operative purchase scheme will have to be worked out. The cultivation of cholam as a fodder crop is also being taken up in the district. As the result of the work done with this crop, a total of 336 lb. of seed of fodder cholam was distributed from the station during the year.

30. The cultivation and manuring experiments at the Chilaw Coconut Trial Ground have been continued during the year, as also have co-operative trials with coconuts upon lands owned by Gate Mudaliyar A. E. Rajapakse. The work on the station at Weligama has been changed somewhat during the year, and areas have been planted up with different oil-yielding grasses in order that most necessary work for the citronella industry may be carried out. The Batapola station is maintained solely as a vegetable demonstration station, and very creditable work has been carried out, especially in regard to the rotation of crops. The work is of the greatest value to village cultivators, and the results obtained are being watched with interest. At Nalanda, experiments with paddy, tobacco, and cotton were conducted, and rotation trials also made. Interesting results have been obtained from green manure trials in paddy fields, and trials with pure-line strains begun. At Dandagamuwa, a vegetable demonstration garden is maintained, and green manure crops are grown for manurial purposes and for seed. At Bibile, sugar cane and cotton crops have given good results. A cotton yield at the rate of 9 cwt. of seed cotton per acre was secured, and, as the result, some eighty cultivators have undertaken to try cotton cultivation this year. Similarly, good results with cotton are expected from the trials at Meegahakiula and

Embilipitiya. Citronella has grown luxuriantly at Godakawela and at Embilipitiya. Private trials at Taldena have also been satisfactory, and there would appear to be no reason why citronella should not be cultivated much more extensively now that the prices are good. At Trincomalee, it has been decided to increase the area under paddy, as drainage on this station still remains unsatisfactory. At the two paddy stations in the Batticaloa District, experiments with cultivation, manuring, and weeding have been carried out. The good results obtained from weeding have been demonstrated, and it has also been shown that a much reduced seed rate could be adopted in the Batticaloa District, if proper cultivation is given. The wasteful method throughout the Batticaloa District of sowing from 3-5 bushels of seed paddy per acre should be condemned by all interested in and connected with the welfare of the district, and every endeavour made to save, at least, half of this quantity for consumption. The results of the Rambukkana plot established for the study of the bunchy top disease of plantains are interesting. They show that all varieties are susceptible to the disease, but that some are more frequently attacked than others. The Hondarawala variety seems to be least affected, but the experiments will have to be continued before any definite conclusion can be drawn. The cotton experiments at Ambalantota Experiment Station have included manuring trials, variety tests, and selection experiments. The yields were considerably less than in previous years, while costs of weeding, owing to the wet weather during the later part of 1923 and the early part of 1924, were greatly increased. These experiments have led to the establishment of cotton cultivation amongst the villagers, and a total of 725 cwt. of cotton of a value of Rs.18,070·91 were purchased for cash payments during the year. This purchase scheme has become popular, and indicates the policy that must be adopted, if the successful cultivation of cotton by small growers is to be looked for.

PESTS AND DISEASES.

31. Work on the "Witches' Broom" disease of tea has been continued during the year. No organism has been found to be constantly associated with the disease, and it is supposed that it may be due to physiological causes not unassociated with soil factors. Tea seedlings affected with eelworms and fungi have been submitted in larger numbers for examination. Termites continue to be the most important insect pests of tea, and experiments for their control are in progress. The control of shot-hole borer by manures has been fully investigated. The experiments upon Sarnia estate have clearly demonstrated the value of manuring with a well-balanced manure mixture, while those carried out at New Peradeniya estate have shown the good results that follow applications of soluble manures, such as nitrate of soda and sulphate of ammonia. Tea tortrix was very prevalent in the Maskeliya district, and the systematic collection of egg-masses was carried out by some estates. Unless this systematic collection of egg-masses is general, and there is the fullest co-operation by all estates, and unless flight breaks are established, the satisfactory control of this pest cannot be expected. A serious outbreak of nettle-grub (*Thosia recta*) was experienced upon one estate in the Morawak korale, and the Entomologist draws the tea industry's attention to the tea pyralid (*Piesmopoda sufimorgirulla*), the caterpillar of which must be regarded as a potentially serious pest of tea. In some areas it appears to be heavily parasitized. Pod and leaf fall disease of rubber was prevalent in the Kalutara and Kelani Valley Districts, but was less severe in the Ratnapura and Galle Districts. A widespread outbreak of the coconut caterpillar (*Nephantis serinopa*) occurred in the North-Western Province. In the Batticaloa District the campaign against this pest has been successful. Similar campaigns against the black beetle and the red weevil have been carried out in the Matara and Batticaloa Districts. A large area of dadaps in the Kandy District was defoliated by *Taragama dorsalis*, which afterwards spread to cacao. It was eventually checked by the collection and destructions of the caterpillars and cocoons and by lopping off and burning the dadap branches which had cocoons attached to them. A die-back disease of dadaps in the Badulla District has been under investigation. This appears after lopping, and it is possible that it may be caused by a species of *Fusarium*. The investigations on the pests of vegetable crops have been continued, and the life-histories of some of them written up. The paddy swarming caterpillar occurred in the Batticaloa District during the early part of the year and did a considerable amount of damage.

32. Bunchy top disease of plantains is becoming more widely spread, and the cause of this disease has not yet been ascertained. In some districts it is thought that the virulence of the disease has decreased since its first occurrence, and that some varieties of plantains withstand the disease better than others. The observation plots established on the Experiment Station, Peradeniya, and at Rambukkana are being continued, and it is hoped that the results of investigations made thereon will be of some assistance towards evolving methods of control.

33. A beginning was made in the Central Division with lectures on plant pests and diseases in conjunction with the lectures on co-operation which were organized for office-bearers of Co-operative Societies. Illustrated leaflets in the vernacular were prepared and distributed at these lectures, and the lectures were fully illustrated by specimens of the pests and diseases dealt with. These lectures were popular and of material assistance to the cultivators who attended them. They will be extended into other districts, and the preparation of leaflets, lantern slides, &c., taken in hand, so that the educational campaign in regard to pests and diseases may be extended. Lectures to cultivators on the swarming caterpillar pest of paddy were also given in the Batticaloa District.

PADDY.

34. The work of the Department for the improvement of paddy cultivation consisted of the following:—

- (1) The selection of pure-line strains by the Economic Botanist on the Experiment Stations at Peradeniya and Anuradhapura.
- (2) The trial of these selected strains by cultivators under the supervision of Divisional Agricultural Officers and Agricultural Instructors.
- (3) Cultivation and manuring experiments and demonstrations financed by the Department.
- (4) Ploughing demonstrations and competitions.
- (5) Prize-holding competitions organized with the object of encouraging the adoption of more intensive methods of cultivation.

35. The work of the Economic Botanist in the selection of pure-line strains has made material progress. A number of long-aged paddies are now available which have given yields between 60 and 90 bushels per acre under three-year tests, and similar pure-lines from mid- and short-aged paddies will be available in 1925. Some of the long-aged pure-lines have been tested in various districts, but their performances have been irregular. In a few cases very successful plots have been grown, but in many instances failures have been reported owing to the variation in the ages of maturity. These ages appear to alter by change of locality, and if varieties are to be recommended to growers with confidence, it will be necessary to establish local test stations. The success of B 12 at Katugastota has been encouraging, and it is expected that considerable areas of this strain will be grown by village cultivators around Katugastota during the next season. Other strains promise well in the Ratnapura and Trincomalee Districts. Cultivation and manurial experiments and demonstrations have been held at 139 centres, and a total number of 371 trial plots have been worked. The effects of manuring have been studied. Green manuring with ephos-phosphate has given very good results in the Southern Province, while in the Province of Uva the best results have been obtained by the use of sterilized animal meal. The beneficial results of manuring are often marred completely by the stifling effects of weeds. In the Eastern Province the value of weeding has been demonstrated, and there are many paddy-growing areas which could give markedly increased yields if the growers could be induced to adopt even one weeding during the growing period.

PRIZE-HOLDING COMPETITIONS.

36. The number of these competitions has again increased, as also has the number of entries. These competitions are now better organized than they were formerly, and the judging has been most carefully done. The thanks of the Colony are due to those gentlemen who assisted the agricultural officers in the final judging of the various competitions organized during the year.

37. The following is a list of the competitions which were held during the year :—

Paddy cultivation competitions	..	25	Cotton cultivation competitions	..	2
Paddy transplanting competitions	..	4	Police garden competitions	..	3
Vegetable garden competitions	..	23	School garden competitions	..	1
Cacao garden competitions	..	2	Potato cultivation competitions	..	1
Tea garden competitions	..	1	Sugar cane competitions	..	1

38. The work of competitors again showed marked improvements. The prizes are substantial, and rivalry between the different entrants is becoming keener and keener year by year. There is no doubt that these competitions go far towards stimulating better methods of cultivation, and I hope to see their number gradually increase. The Agricultural Instructors visit entrants to these competitions regularly and have during the year done useful work.

39. Mr. J. P. Obeyesekere, Mudaliyar of Siyane korale east, offered two prizes, one of Rs. 100 and another of Rs. 50, for a period of five years, for competition amongst the school gardens in his korale, with a view to improving paddy cultivation, and the awards were made in February, 1925.

40. The prize of Rs. 100 contributed by the Hon. Lieut.-Colonel T. Y. Wright in 1923 for competition among school gardens in the North-Western Province was repeated in 1924.

41. A Challenge Cup was offered by the Hon. Mr. G. S. Schneider for competition among registered school gardens in the Chilaw and Puttalam Districts. The cup was won by CH/Kelegama vernacular mixed school, Rajakadalawa.

42. Mudaliyar D. J. W. Samarakoon offered prizes of the value of Rs. 25 to school children in the Demala hatpattu.

43. The thanks of the Department are due to these generous donors.

AGRICULTURAL SHOWS.

44. Agricultural shows were held during the year at the following centres :—Chunakam in Jaffna District, Trincomalee, Kandy, Alawatugoda, Rattota, Matale, Hanguranketa, Kurunegala, Wariyapola, Chilaw, Badulla, Batticaloa, and Kekanadura.

45. At all these shows the Department was represented, and, at some of them, a series of lectures was organized. Much of the work in connection with the organization of these shows and with judging at them falls upon agricultural officers. They have, without exception, performed their duties in connection with shows most satisfactorily, and it has enabled them to get into touch with a number of cultivators. The opportunity afforded at these shows to the officers of the Department to bring to the notice of agriculturists the lines on which the work of the Department are developing has also been made good use of.

DISTRICT AGRICULTURAL COMMITTEES.

46. These Committees have been formed for the Kandy, Nuwara Eliya, Matale, Kegalla, and Matara Districts, and the following are the principal items which have appeared on the agenda :—

Nuwara Eliya.
Tea Garden Competition and Paddy Cultivation Competitions.

Matale.
Rats and Crab Pests.
Agricultural Shows and Competitions.
Bunchy Top Plantain Disease.
Paddy Pests.
Cotton Cultivation.
Sun Hemp as Green Manure.
Cacao Cultivation Competitions.

Transport of Jak Trees.
Register of Village Agricultural Requirements.

Kegalla.
Agricultural Shows and Competitions.
Jak Plantation Competitions.
Cotton Trials.

Matara.
Agricultural Experiments.
Plant Pests.
Working of Co-operative Societies.